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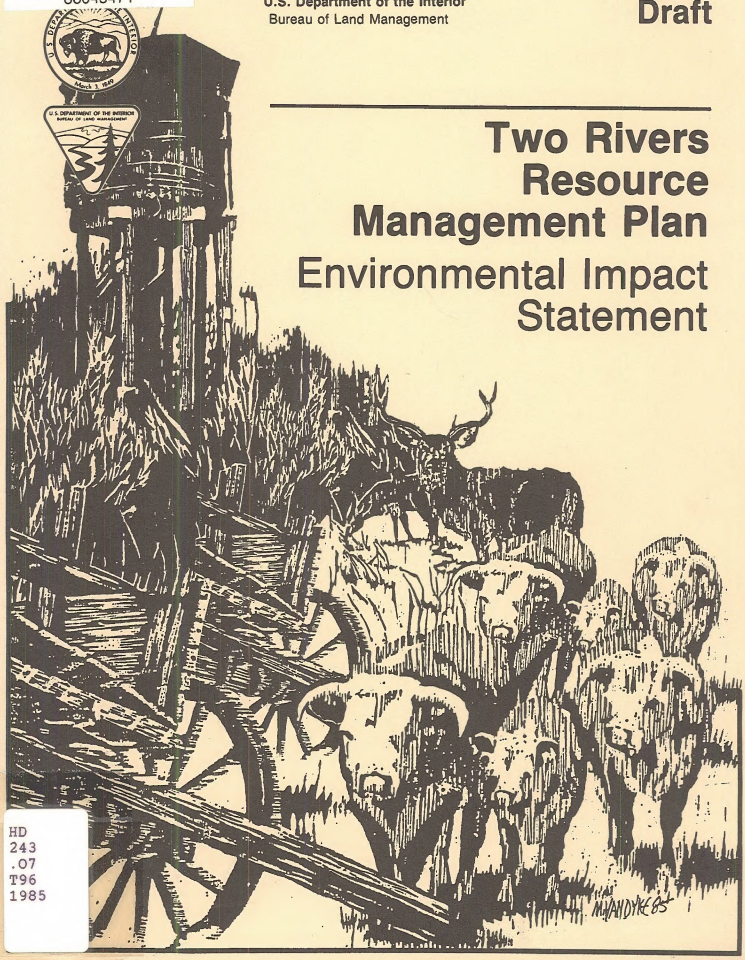
Two Rivers Resource Management Plan

Environmental Impact Statement



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BUREAU OF LAND MANAGEMENT

PRINEVILLE DISTRICT OFFICE
P.O. Box 550 (185 E. 4th Street)
Prineville, Oregon 97754

Dear Public Land User:

You are invited to assist the Bureau of Land Management in a planning process that is important to you and your interests.

We ask your participation in evaluating this draft of the Two Rivers Resource Management Plan/Environmental Impact Statement (RMP/EIS) that has been prepared in conformance with planning procedures established under the Federal Land Policy and Management Act of 1976.

The planning area encompassed by this document is the northern half of BLM's Prineville District. Each of the options or alternatives presented would prescribe the direction for management of resources on public lands for the next 10 to 15 years. Each of the alternatives—including the preferred alternative—relates to issues many of you have helped us to identify.

There are five resource management alternatives, each with a different emphasis. Public comment was considered in developing and analyzing issues and alternatives in this RMP/EIS. Also considered was information supplied by local governments, known interest groups, and data gathered from staff discussion. Before the preferred alternative was developed suggestions were thoroughly considered to leave management practices just as they are; to emphasize commodity production; to protect natural values while still accommodating the production of commodities; and to completely protect and enhance natural values.

The alternatives were designed primarily to resolve, in different ways, the land management issues identified in the early stages of the planning process.

The BLM has tentatively established resource management goals and objectives; potential land uses; levels of resource production; land areas that can be used for multiple purposes; and lands that should be transferred, sold or exchanged. We would appreciate you reviewing this document thoroughly and giving us your written comments by June 30, 1985. BLM employees will be available at informal public meetings to be held during the 90 day public comment period at Condon on May 21, 1985, at 7:00 P.M. at the Gilliam County Courthouse, or at Grass Valley on May 22, 1985, at 7:00 P.M. at the South Sherman Elementary School for individuals wishing to ask questions or to present comments.

Thank you for your interest and your help in this planning effort. We anticipate your continued interest, support and participation.

Sincerely yours,

Gerald E. Magnuson

Gerald E. Magnuson
District Manager

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Two Rivers Resource Management Plan

Environmental Impact Statement

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Prepared by
Prineville District Office
Bureau of Land Management
U.S. Department of the Interior
1985

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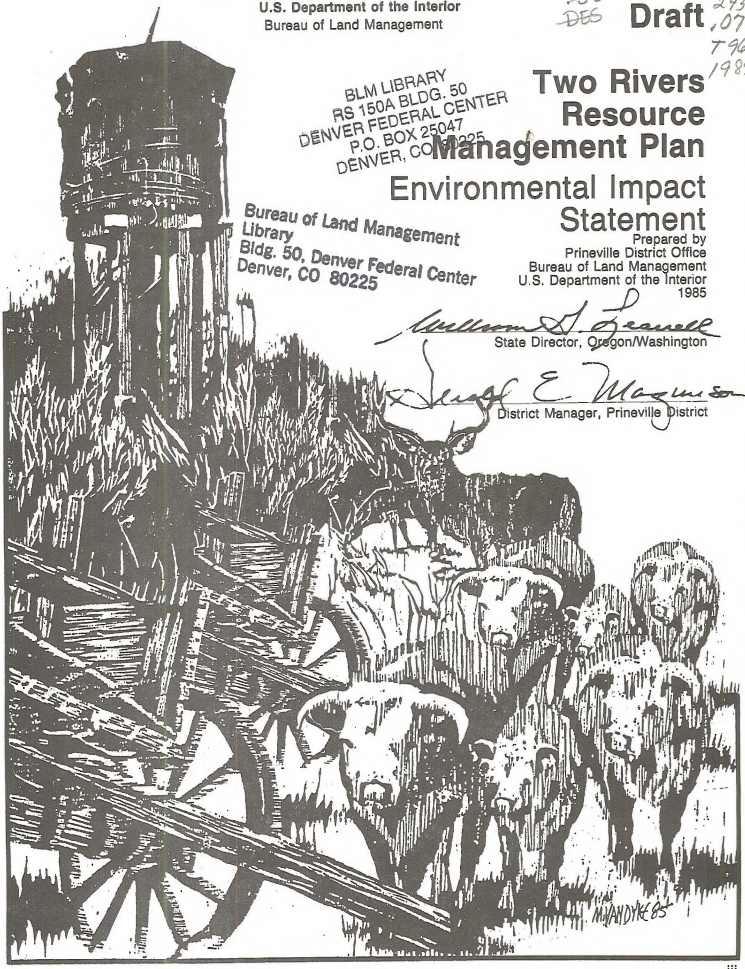

Two Rivers Resource Management Plan and Environmental Impact Statement

Draft (X) Final ( ) RMP/EIS
Department of the Interior, Bureau of Land Management

1. Type of Action: Administrative (X) Legislative ( )

2. Abstract: This Draft Resource Management Plan/Environmental Impact Statement discusses resource management on 324,705 acres of public lands administered by the Bureau of Land Management in the Prineville District. The Preferred Plan proposes to harvest timber on 10,715 acres with a sustained annual harvest level of 1.41 million board feet (MMbf); grazing management would continue on 292,736 acres (233 grazing allotments) of public land; riparian vegetation condition would be improved on 1,057 acres; wildlife and fish habitat would be maintained or improved; approximately 1,000 acres of public land would be offered for sale annually over the planning period; and cultural, soil, water, botanical, visual and recreational resources would be protected.

3. Five alternatives are analyzed:

A. Preferred
B. Emphasize Commodity Production and Enhancement of Economic Benefits
C. Continue Existing Management (No Action)
D. Emphasize Natural Values While Accommodating Commodity Production.
E. Emphasize Natural Values

4. The comment period will be 90 days, ending June 30, 1985.

5. For further information contact:

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RMP/EIS Team Leader
Bureau of Land Management, Prineville District Office
185 East Fourth Street
P.O. Box 550
Prineville, OR 97754
Telephone (503) 447-4115

SUMMARY

Five multiple use alternatives for the management of public lands in the Two Rivers Planning Area have been developed and analyzed in accordance with the Bureau's planning regulations issued under authority of the Federal Land Policy and Management Act of 1976. The alternatives respond to eight major issues: livestock grazing, riparian management, wildlife habitat, land tenure and access, minerals management, forestry, recreation and special management areas identified through the planning process. The purpose of the proposed alternatives is to present and evaluate options for managing, protecting and enhancing public resources.

Each alternative is a master plan that would provide a framework within which future, more site specific decisions would be made, such as defining the intensity of management of various resources, developing activity plans (e.g.,grazing allotment management plans and transportation plans) or issuing rights of way, leases or permits.

The five alternatives considered are:

Alternative A (Preferred Alternative)
The Preferred Alternative emphasizes the management, production, and use of renewable resources on the majority of the public lands in the Two Rivers Planning Area. Management would be directed toward providing a flow of renewable resources from the public lands on a sustained yield basis while protecting or enhancing natural values. This alternative represents the Bureau's favored management approach.

1. All riparian areas along the Deschutes and John Day rivers and their major tributaries would be managed to full potential, with a minimum of 60 percent of the vegetative potential to be achieved within 20 years.

High mid seral to low late seral ecological condition would be managed for on upland vegetation except where wildlife needs would dictate otherwise.

2. Forage requirements for deer and elk on public lands would be met. Upland vegetation would be managed to achieve maximum wildlife habitat diversity. All streams with fisheries or fisheries potential would be managed to achieve a good to excellent aquatic habitat condition.

3. Forage available for livestock would remain at 17,778 AUMs in the short term and would be increased to 19,920 in the long term. Projects would be implemented as necessary to maintain current livestock grazing levels and to meet riparian and upland vegetation management objectives.

4. A total of 33,600 acres would receive additional study to determine whether they should be sold or otherwise disposed of. Approximately 1,000 acres of land would be sold annually.

5. There would be 10,715 acres of commercial forestland on which a 1.41 MMbf/year sustained timber harvest level would be based.

6. Public lands would remain open for exploration and development of mineral resources and related rights of way. Restrictive stipulations for oil and gas exploration and development would remain in effect on 132,000 acres of public land, to protect areas with high visual quality.

7. Approximately 20,000 acres would be be limited or closed to off road vehicle use.

8. Five areas with identified outstanding natural or cultural values would be designated as research natural areas, areas of critical environmental concern, or outstanding natural areas. Other unique wildlife or ecological values would be maintained or enhanced.

Alternative B (Emphasize Commodity Production and Enhancement of Economic Benefits).

This alternative emphasizes providing economic benefits. Multiple use management would emphasize the production of goods and services on public lands within the Two Rivers Planning Area to meet local and possibly regional demands.

1. Riparian areas would be managed to achieve a goal of 60 percent of potential production.

2. Forage needs for deer and elk would be met.

3. Forage available for livestock would increase to 19,189 AUMs in the short term and 24,217 AUMs in the long term.

4. A total of 143,000 acres would receive additional study to determine whether they should be disposed of.

5. There would be 10,984 acres of commercial forestland on which a 1.45 MMbf/year sustained timber harvest level would be based.

6. Public lands would remain open for the exploration and development of mineral resources and related rights of way. The area of no surface occupancy restriction would be reduced to 60,000 acres within the one half mile wide state scenic waterways corridor in the Deschutes and John Day canyons.

7. Approximately 10,000 acres would be limited or closed to off road vehicle use.

8. Two areas would be designated as a research natural area and an area of critical environmental concern. Unique values within other special management areas would be maintained where no significant conflicts with commodity production occur.

Alternative C. Continue Management (No Action)

This alternative allows for the management and flow of outputs from the public lands and resources in the planning area at their present levels. The planning area is presently operating under a 1975 Management Framework Plan (MFP). Formal management direction is derived from the MFP with on the ground actions following an interdisciplinary analysis process.

1. Existing riparian exclosures would be maintained on 16 percent of the riparian areas. The remainder would continue to be grazed by livestock.

2. Existing wildlife habitat management plans would be continued. Forage needs for deer and elk would be met.

3. Forage available for livestock would remain at 17,778 AUMs.

4. Up to 4,000 acres would receive additional study to determine whether they should be disposed of.

5. There would be 10,833 acres of commercial forestland on which a 1.43 MMbf/year sustained timber harvest level would be based.

6. Public lands would remain open for exploration and development of mineral resources and related rights of way. Existing stipulations for no surface occupancy on oil and gas exploration and development would be maintained on 132,000 acres to protect areas with high visual quality.

7. Approximately 20,000 acres would be limited or closed to off road vehicle use.

8. Efforts to protect identified special management areas would continue.

Alternative D (Emphasize Natural Values While Accommodating Commodity Production)

This alternative emphasizes protection, maintenance and enhancement of the natural environment within the planning area. The production of commodities would occur where significant conflicts with the protection of natural values could be avoided or mitigated.

1. Riparian areas totalling 1,070 acres would be excluded from grazing. The remaining 210 acres, where fencing to exclude livestock is not feasible, would be managed to maintain or achieve 60 percent of potential.

2. Management of wildlife habitat on public land would receive special consideration in all areas. Deer and elk forage requirements would be met.

3. Forage available for livestock would decrease to 12,309 AUMs in the short term and 13,834 AUMs in the long term.

4. A total of 33,610 acres would receive additional study to determine whether they should be disposed of.

5. There would be 10,745 acres of commercial forestland on which a 1.42 MMbf/year sustained timber harvest level would be based.

6. Public lands would remain open for exploration and development of mineral resources and related rights of way where no significant conflicts exist with wildlife, riparian or recreation values. Existing stipulations for no surface occupancy on oil and gas exploration and development would be expanded to include 150,000 acres.

7. Approximately 150,000 acres would be limited or closed to off road vehicle use.

8. Four areas would be designated as research natural areas or as areas of critical environmental concern. Other unique wildlife or ecological values would be maintained or enhanced.

Alternative E (Emphasize Natural Values)

This alternative emphasizes the enhancement of natural values.

1. All riparian areas located on public lands would be excluded from livestock grazing.

2. Management of wildlife would receive special consideration in all areas. Deer and elk forage requirements would be met.

3. Livestock grazing would be eliminated from public lands in the planning area.

4. No public lands would be offered for sale.

5. No regularly scheduled forest product sales would occur. Harvest of diseased or damaged timber would occur if it did not conflict with wildlife and fisheries habitat, visual, riparian or the protection and enhancement of other resource values. This would amount to approximately .02 MMbf/year.

6. Exploration and development of mineral resources would be allowed where no significant conflicts exist with wildlife, riparian, recreation or scenic values. Existing no surface occupancy stipulations on oil and gas exploration and development would be expanded to include 200,000 acres.

7. Approximately 200,000 acres would be limited or closed to off road vehicle use.

8. Ten areas would be designated as research natural areas, areas of critical environmental concern or outstanding natural areas. Other unique wildlife or ecological areas would be maintained or enhanced.

Summary of Environmental Consequences

Soil

The rate of soil erosion over both the short and long term would decrease under Alternatives A, B, D and E due to improved streambank stability. There would be no change under Alternative C.

Water

None of the alternatives would significantly affect overall water yield. Water quality would improve under Alternatives A, B, D and E due to increased streambank stability. This would result in a slower and extended release of water, thus improving water quality during critical low flow periods. Water quality under Alternative C would remain unchanged.

Vegetation

Minor changes in vegetation types would occur under all alternatives. Ecological condition and plant diversity would also change under every alternative with the greatest change occurring under Alternative E.

Riparian vegetation would show improvements under every alternative except C. Alternatives A, D and E would show the greatest improvement.

Forest vegetation would be affected to the greatest degree under Alternatives A, B, C and D through timber harvesting. No significant impacts would occur under Alternative E.No significant impacts to threatened, endangered or sensitive species would occur under any alternative.

Wildlife

Habitat diversity and condition of crucial winter ranges would improve under Alternatives A, B, D and E due to the implementation of grazing systems, decreased stocking rates, or exclusion of livestock. However, adverse impacts to upland habitat would also occur under Alternative B due to forestry practices, mineral operations, acquisition of public access and ORV use.

Fencing of riparian habitats to exclude livestock under Alternatives A, D and E would significantly improve habitat conditions. Lesser improvement would occur under Alternative B.

No significant impacts would occur under Alternative C.

Fish habitat would improve and fish populations would increase on all streams under Alternatives A, D and E as a result of riparian fencing and exclusion of livestock. Overall improvements would also occur under Alternative B with no change under Alternative C.

Livestock Grazing

Long term increases in forage available to livestock would occur under Alternatives A and B. Forage levels would remain the same under Alternative C and decrease under Alternatives D and E. Under Alternative E no livestock grazing would occur on the public lands.

Forest Products

Annual timber harvest levels would be the greatest under Alternative B and slightly less under Alternatives A, C and D. Timber harvest would be reduced to a custodial level under Alternative E.

Energy and Minerals

Impacts to oil and gas availability (no surface occupancy restrictions) would be greatest under Alternative E followed by Alternatives D, C and A. The number of acres with no surface occupancy stipulations would be reduced from present levels under Alternative B.

Economic Conditions

Increased income to livestock operators and farmers utilizing public land would occur under Alternative B. Some gains and some losses of income would occur under Alternative A. There would be no change under Alternative C. Alternatives D and E would reduce overall farm and ranch income from present levels. Under no alternative would there be a significant impact on the local economy as a result of changes in the use of the public lands.

Recreation

Recreation use levels would not be significantly affected under any of the alternatives. All

alternatives except C would, however, increase overall use levels slightly. Use levels would remain constant under Alternative C.

Cultural Resources

Appropriate measures would be taken to identify and protect cultural sites prior to ground disturbing activities. No impacts would occur to known cultural sites.

Visual Resources

Visual quality would be enhanced under Alternatives A, D and E. While fence construction and land treatment would cause impacts in the short term, they would diminish over the long term and visual quality would improve as a result of improved vegetative condition and increased plant diversity. Overall visual quality would also improve slightly under Alternative B as a result of improved vegetative condition in spite of adverse impacts from ORV use and mineral exploration. There would be no significant change in visual quality under Alternative C.

Special Management Areas

Alternatives A, D and E would further protect the 13 identified special management areas. Overall, Alternatives B and C would have slight adverse impacts to the unique values of these areas.

Comparison of Impacts

Table 1 compares the impacts of each alternative in tabular form. While impacts are described in detail in Chapter 4, Table 1 is presented to assist decision makers and reviewers by summarizing the impacts of each alternative.

Table 1 Summary, Long Term Environmental Consequences: Comparison of Alternatives

Resource	Unit of Measure	Existing Situation	Alternative A (Preferred)	Alternative B (Commodity Production)	Alternative C (Existing Management)	Alternative D (Natural Values w/Commodities)	Alternative E (Natural Values)
Soil							
Streambank Stability	--	--	+M	+L	NC	+M	+M
Water							
Quality	--	--	+L	+L	NC	+L	+L
Vegetation							
Vegetation Type	--	--	L	L	NC	L	L
Ecological Condition	000's of acres						
Climax		25	24	24	17	24	24
Late Seral		107	168	168	101	168	175
Mid Seral		95	65	64	90	65	59
Early Seral		88	58	56	107	58	57
Other		9	9	12	9	9	9
Plant Diversity	000's of acres						
High		95	116	115	94	115	116
Low		220	199	200	221	200	199
Unknown		9	9	9	9	9	9
Reparian	acres						
Climax		223	1,024	821	368	1,024	1,024
Late Seral		196	0	0	140	0	0
Mid Seral		137	256	332	60	256	256
Early Seral		724	0	127	712	0	0
Threatened, Endangered or Sensitive Species	--	--	NC	NC	NC	NC	NC
Wildlife							
Upland Habitat		--	+M	-L	NC	+M	+M
Riparian Habitat		--	+H	+L	NC	+H	+
Fish		-	+M	+L	NC	+H	+H
Lifestock Grazing							
Available Forage	AUMs	17,778	19,920	24,217	17,778	13,834	0
Forest Products							
Sustainable Harvest Level	MMbf	1.43	1.41	1.45	1.43	1.42	.2
Energy & Minerals	acres						
No Oil & Gas Leasing		3,000	3,000	3,000	3,000	3,000	3,000
No Surgace Occupancy (Oil and Gas)		132,000	132,000	60,000	132,000	150,000	200,000
Economic Conditions							
Long Term Loss or Gain In Value	dollars	--	+129.000	+386.000	0	-237,000	-1,066,000
Recreation							
Visitors Use Levels	visitor days	62,000	+L	+L	NC	+L	+L
Off Road Vehicle Limitation/Closure	acres	--	20,000	10,000	20,000	150,000	200,000
Cultural Resources							
Protection of Values	--	--	+L	+L	NC	+L	+M
Visual Resources							
Protection/ Enhancement of Visual Quality	--	--	+L	+L	NC	+L	+M
Special Management Areas							
Protection of Values	--	--	+L	+L	-L	+L	+L

+ = beneficial impact
- = adverse impact
NC = no change
L = low
M = moderate
H = high

Table of Contents

Chapter 1: Purpose and Need 1
Introduction 1
Purpose and Need 1
Planning Process and Criteria 4
Issues 4
Issues Eliminated from Detailed Study 5
BLM Planning and Resource Interrelationships 5

Chapter 2: Description of Alternatives Including the Preferred Alternative 11
Alternatives to be Analyzed/Eliminated from Detailed Study 12
Rationale for Selection of the Preferred Alternative 12
Management Guidance Common to All Alternatives 12
Requirements for Further Environmental Analysis 18
Management Direction by Alternative 20

Chapter 3: Affected Environment 27
Soil 28
Water 28
Climate 30
Vegetation 30
Wildlife 32
Livestock Grazing 37
Forestland 40
Energy and Mineral Resources 42
Land Tenure and Access 42
Economic Conditions 44
Recreation 48
Cultural Resources 50
Visual Resources 52
Special Management Areas 52

Chapter 4: Environmental Consequences 57
Introduction 58
Impacts to Soil 58
Impacts to Water 58
Impacts to Vegetation 58
Impacts to Wildlife 62
Impacts to Livestock Grazing 64
Impacts to Forest Products 64
Impacts to Energy and Minerals 65
Impacts to Economic Conditions 66
Impacts to Recreation 69
Impacts to Cultural Resources 70
Impacts to Visual Resources 71
Impacts to Special Management Areas 71

Chapter 5: Consultation and Distribution 73
Public Involvement 74
Agencies and Organizations Contacted or Consulted 74
List of Agencies, Persons and Organizations to Whom Copies of the RMP/EIS Have Been Sent 75

Chapter 6: References, Glossary and Index 77
List of Preparers 78
References Cited 79
Glossary of Terms 80
Index 85

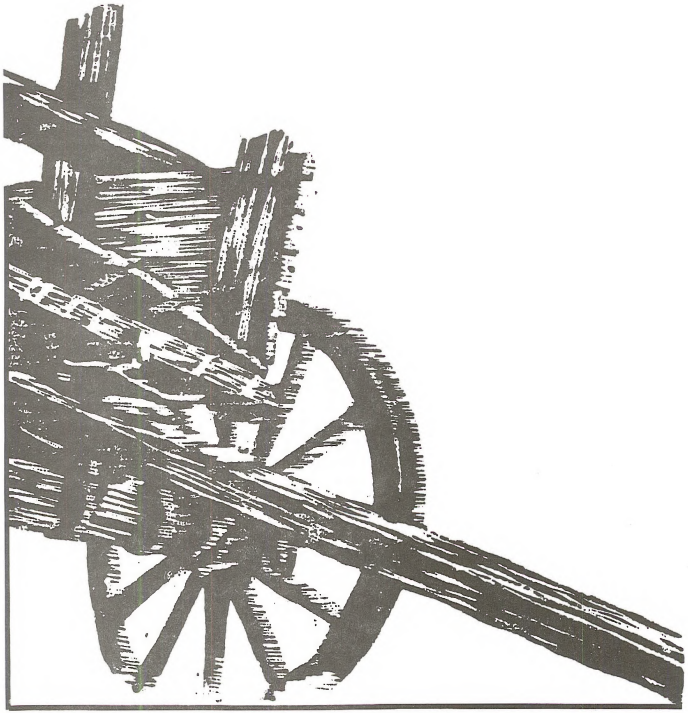
Appendices
Appendix A—Public Involvement 89
Appendix B—Planning Overview 91
Appendix C—Planning Criteria 93
Appendix D—Goals and Objectives of Land Use Alternatives 95
Appendix E—Selective Management Category, Acres Public Land, Current Livestock Use and Ecological Condition by Allotment 99
Appendix F—Range Monitoring Studies 103
Appendix G—Discussion of Grazing Treatments and Existing/Proposed Systems 105
Appendix H—Design Standards and Standard Operating Procedures for Range Developments 109
Appendix I—Standard Operating Procedures for Forest Practices 111
Appendix J—Potential Land Disposal Tracts in Zone 3 113
Appendix K—Initial and Predicted Long Term Livestock Forage Use 117
Appendix L—Rangeland Developments Proposed Under Alternatives A and B 121
Appendix M—Water Quality Measurements 125
Appendix N—Stream Channel Stability, Fish Habitat and Estimated Trend 129
Appendix O—Methodology Used to Determine Vegetation Site Classification and Predict Ecological Condition 139
Appendix P—Wildlife Habitat Interrelationships 141
Appendix Q—Areas Containing High Recreational Values 147
Appendix R—Public Land Areas Containing Collectible Mineral, Plant or Invertebrate Fossils 149

Maps
1—General Location 2
2—Planning Area and Land Status 3
3—Land Tenure 19
4—General Soils 29
5—Riparian Areas and Wildlife Habitat 35
6—Fish Habitat 38
7—Grazing Allotments 39
8—Areas Suitable for Timber Production 41
9—Minerals Potential 43
10—Utility/Transportation Corridors; Communication Sites 45
11—Off Road Vehicle Use and Areas Having Rockhounding Potential 49
12—Areas of High Visual Quality 53
13—Special Management Areas 55

Tables
1—Summary, Environmental Consequences, Preferred and Other Alternatives .....
2—Public Land Acreage, Two Rivers Planning Area 1
3—Consistency of the Alternatives with State of Oregon Wildlife Goals and Basic Objectives of the Forestry Program for Oregon 8
4—Relationship of the Preferred and Other Alternatives to County

Comprehensive Plans as They Incorporate and Reflect Statewide Land Conservation and Development Goals 9
5—Public Land Zones and Acreage by County 17
6—Grazing Systems by Alternative and Management Category (Allotments/Acres) 23
7—Forestry Practices by Alternative (Each Decade) 24
8—Comparative Leasing Options 25
9—Soil Characteristics Summary 28
10—Vegetation Types 31
11—Present Ecological Condition 32
12—Summary of Ecological Condition of Riparian Vegetation (Acres Public Land) 32
13—Summary of Ecological Trend of Riparian Vegetation (Acres Public Land) 32
14—Threatened, Endangered or Sensitive Plant Species 33
15—Wildlife Habitat and Species Use 34
16—Crucial and Important Wildlife Habitats 34
17—Fish Habitat Condition (Miles on Public Land) 37
18—Fish Habitat Trend 37
19—Grazing Allotment Summary 40
20—Forestland by County (Acres of Public Land) 40
21—Major Minerals Found in Planning Area 41
22—Population by County (1960 to 1980) 47
23—Employment by Source, 1982 47
24—Lessee Dependence on BLM Forage by Herd Size 47
25—Estimated Public Land Recreation Use 48
26—Summary of Special Management Area Resource Values 54
27—Summary of Long Term Environmental Consequences for Soil and Water Resources 59
28—Existing and Predicted Long Term Ecological Conditions, Plant Diversity and Livestock Forage 60
29—Stream Fish Habitat, Estimated Condition and Trend (Miles on Public Land) 64
30—Determination of Sustainable Harvest Level by Alternative 66
31—Number of Lessees Affected by Change in Public Forage 67
32—Number of Lessees With Loss or Gain in Ranch Value 68
33—Agricultural Income on Public Lands 69
34—Predicted Long Term Changes in Recreation Visitor Use 69
35—Impacts to Special or Unique Resource Values by Alternative 71

Chapter 1
Purpose and Need



Old wagons on the banks of the John Day River

Introduction: The Planning Area

This Resource Management Plan/Environmental Impact Statement (RMP/EIS) is designed to provide a comprehensive framework for managing public lands in the Two Rivers Planning Area and allocating resources in that area for the next 10 to 15 years. The document analyzes impacts associated with management of 324,705 acres of public land and 384,074 acres of subsurface mineral estate underlying private land in the Two Rivers Planning Area where the Bureau of Land Management (BLM) is the administering agency. The two rivers, for purposes of identification in this document, are the John Day River and Deschutes River.

The land being considered in the Two Rivers RMP/EIS is located in the Central Oregon corridor between the Cascade Mountain Range on the west and Morrow and Grant counties to the east, in an area north from Crook and Deschutes counties to the Columbia River as shown on Map 1. The area includes public lands scattered across seven counties as shown in Table 2.

Table 2. Public Land Acreage, Two Rivers Planning Area

County	Public Land Administered by BLM[1]	Private Surface Federal Subsurface Mineral Estate	Total Acreage of County
Crook (Big Summit Prairie)	4,431	1,201	1,908,000
Gilliam	52,913	53,825	1,312,000
Hood River	360	96	343,000
Jefferson	45,844	79,570	1,149,000
Sherman	54,576	24,357	534,000
Wasco	71,429	103,901	1,531,000
Wheeler	95,157	121,124	1,092,000
Total Acreage	324,705	384,074	7,869,000

[1]Acreages of public land in the planning area were audited after the Proposed Land Use Alternative brochure was published. Acreage figures reflect changes that include listing lands withdrawn for power sites along the Deschutes and John Day rivers; land acquired and ultimately disposed of through exchanges; acreages within the Crooked River National Grasslands that were not withdrawn by the U.S. Forest Service; and land disposed of through public sale.

The planning area is bounded by four national forests—Mt. Hood, Deschutes, Ochoco and Umatilla—and the John Day Fossil Beds National Monument, which is administered by the National Park Service. Also located adjacent to the planning area is the reservation of the Confederated Tribes of Warm Springs.

Big Summit Prairie is a blend of public and private lands, an island that includes approximately 4,400 acres of Public land surrounded by the Ochoco National Forest in Crook County. Transfer of the Prairie to the jurisdiction of the U.S. Forest Service has been considered for several years. The recently announced BLM/USFS interchange would accomplish this transfer. The Prairie is included, and will be analyzed as a part of the Two Rivers RMP/EIS since it was still BLM responsibility at the time this document was being prepared.Map 2 shows the boundary and public lands within the Two Rivers Planning Area.

The Bureau of Land Management administers the public lands in the planning area from the District Office in Prineville, Oregon. The intermingling of Public land with other Federal lands administered by other agencies has led to cooperative management on some of the lands.

Purpose and Need

The resource management plan, by its very nature, suggests guidelines for the management of public lands in the Two Rivers Planning Area. It also provides a platform for management of all resources and uses within the principles of multiple use and sustained resource yield.

The preferred alternative identified in this document was selected on the basis of input from public meetings and comments made through correspondence, contacts with local governments, suggestions from user groups, and staff discussion as explained in Appendix A. The plan was developed under the requirements of the Federal Land Policy and Management Act (FLPMA) and involved interdisciplinary planning processes applicable to multiple use and sustained resource yield.

This RMP/EIS is written in compliance with the National Environmental Policy Act of 1969 (NEPA), the Council on Environmental Quality regulations and in specific response to litigation in the Natural Resources Defense Council et al. versus Rogers C. B. Morton et al. 1973 (U.S. District Court for the District of Columbia, ref. Case No. 1983-73). That

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Bureau of Land Management
PRINEVILLE DISTRICT
1985

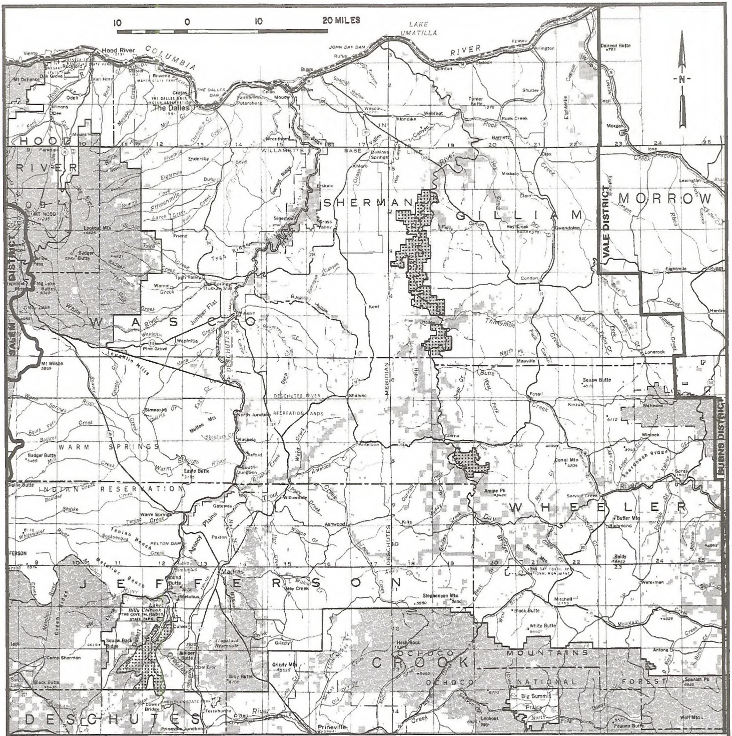
BLM State Office

BLM District Office

District Boundary

Two Rivers Planning Area

MAP 1
General Location



BLM Land (Public Land)

U. S. Forest Service

Areas Considered for Wilderness Designation in Seperate Studies

— Two Rivers Planning Area Boundary

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PRINEVILLE DISTRICT
1985

MAP 2
Planning Area and Land Status

suit alleged that the Bureau of Land Management's programmatic grazing EIS did not comply with the National Environmental Policy Act. As a result of the settlement of this suit, BLM agreed to prepare site specific grazing EISs. The Two Rivers RMP/EIS will meet this requirement.

Planning Process and Criteria

The Bureau of Land Management planning process involves public involvement at various stages. Two public meetings have been held on the Two Rivers Planning Area—one in Condon and one in Grass Valley. The resulting responses have been incorporated in the preparation of this proposal.

The planning process is designed to enable the BLM to accommodate the uses the public wants to make of public lands while complying with laws established by the Congress and policies implemented by the executive branch of the Federal government. This process involves nine steps presented in a resource management planning process overview in Appendix B.

The planning criteria considered in the preparation of an RMP/EIS help to evaluate alternatives and select or develop a composite preferred land use alternative. The alternatives were developed to meet national guidance. The planning criteria considered in the development of the preferred alternative are outlined in Appendix C.

Issues

Federal planning regulations generally equate land use equate land use planning with problem solving—resolving issues. That problem solving process included application of the principles of multiple use and sustained resource yield set forth in the Federal Land Policy and Management Act and though other applicable laws.

A number of specific issues were identified in public comments at the meetings, in response to a brochure and to other documents on the planning area, and on the basis of input from a number of groups and governmental organizations.

Those identified issues which will be analyzed in detail are: riparian management; wildlife habitat management; grazing management; forestry; minerals management; land tenure and access; recreation management excluding recreation river use and wilderness (see pages 99 and 99); and designation of special management areas.

1. Wildlife Habitat Management

Available habitat for big game and other animals is not adequate in some areas. Improvement in riparian and upland habitat would contribute to year round accessibility of food and shelter for wildlife.

2. Livestock Grazing Management

There is a conflict of use between livestock grazing and other important resource uses. Some management changes may be appropriate to improve ecological condition and provide equitable forage opportunities for livestock and wildlife; to reestablish, expand, improve or protect riparian areas; and to address nonconsumptive uses. Solutions are needed for stocking levels, season of use, grazing systems, range development projects, and land treatments. Improvement in ecological condition will be slow unless it is coupled with a reduction in sagebrush and juniper cover in some areas. Poor livestock distribution is evident in some allotments, which results in heavy use of favored areas and minimum use elsewhere. That condition will have to be corrected if proper ecological condition is to be maintained or achieved.

3. Riparian Management

Overall condition of riparian vegetation in the planning area is at less than potential.

Protection of riparian areas along the two rivers and their tributaries is essential to improve watershed condition as well as fish and wildlife habitat. By building fences, regulating livestock access to the riparian areas, or changing the timing of livestock grazing, the integrity of the riparian habitat would be protected and/or improved for fish spawning; waterfowl nesting and use by big game.

4. Forestry

A sustainable allowable harvest level needs to be established which would provide timber sales to assist in meeting local and regional needs. Other resource values need to be protected through appropriate land use allocations which may include restricting or excluding timber harvesting activities.

5. Minerals Management

Conflicts related to mineral exploration and related

rights of way exist. The need to allow maximum mineral availability while protecting other resource values must be achieved.

6. Land Tenure and Access

Adjustments in land ownership in parts of the planning area are appropriate to achieve more efficient management and utilization of public resources. Areas need to be identified that should remain under BLM management as well as those which should be exchanged, transferred or sold. Agricultural use and occupancy of public land needs to be addressed and resolved.

7. Recreation Management

Known or potential conflicts that exist between recreation and other resource programs need to be resolved. The demand for dispersed recreational opportunities needs to be considered along with off road vehicle use in relation to its accessibility and its effects on the land and other resource values in the planning area. The need exists to recognize the interests of rockhounds and other special mineral interests. Recreation river use and wilderness designation have been or will be analyzed in separate documents. They are not considered in this RMP/EIS.

8. Special Management Areas

Some areas warrant special consideration for formal designation as areas of critical environmental concern (ACEC), outstanding natural areas (ONA) or research natural areas (RNA). These special areas have been identified and should be considered for designation in the appropriate categories to further protect or improve habitat of threatened, endangered or sensitive species; provide for scientific and educational educational study opportunities; and to protect cultural resources in accordance with Federal laws and requirements.

Issues Eliminated from Detailed Study

Two items were considered as potential issues within the Two Rivers Planning Area, but were eliminated from detailed study as described below:

1. Wilderness

The wilderness study process has continued since 1979 and has progressed beyond the level of detail contained in this RMP/EIS. Five areas are being considered for wilderness designation in the Two Rivers Planning Area. They include Spring Basin, North Pole Ridge, Thirtymile, Lower John Day and Deschutes Canyon/Steelhead Falls. They are shown on Map 2. Recommendations on the suitability of Spring Basin, North Pole Ridge, Thirtymile and the Lower John Day WSAs for wilderness designation are analyzed in a draft statewide EIS scheduled for release later in the spring of 1985. The Deschutes Canyon/Steelhead Falls area is also being analyzed for possible wilderness designation under Section 202 of the Federal Land Policy and Management Act in a joint study with the Ochoco National Forest.

2. Recreation River Use of the Lower Deschutes and Lower John Day Rivers

Recreation use of the lower 100 miles of the Deschutes River, a component of the Oregon State Scenic Waterway System, has been studied by several agencies. Management challenges can only be resolved by continuing coordination of activities among the BLM, Oregon State Parks and Recreation Division of the Department of Transportation, Oregon Department of Fish and Wildlife, Oregon State Marine Board, Confederated Tribes of the Warm Springs Indian Reservation, private landowners and Jefferson, Sherman and Wasco counties. This group has developed plans for recreation management of this river corridor downstream from Warm Springs.

The lower 147 miles of the John Day River, also a state scenic waterway, will require a specific plan for managing recreational use downstream from Service Creek. Issues such as recreation use levels, recreation facilities and trespass are very specific concerns and are beyond the purpose and intent of this document. Recreation planning on the John Day River also needs to be accomplished jointly with other managing agencies and with the public.

BLM Planning and Resource Interrelationships

Interagency coordination between the BLM and other Federal agencies, State governments, local governments, and Indian tribes is required under Bureau planning regulations (43 CFR, Part 1610.3), and by several cooperative agreements or memoranda of understanding. The following summaries delineate these relationships.

A "one holer" at an adandoned homestead

1. Federal Agencies

With parts of four national forests administered by the U.S. Forest Service (USFS) adjacent to the Two Rivers Planning Area, it is important that the two agencies strive to achieve similar resource management goals on adjoining BLM and USFS lands. Many of the livestock operators now using public lands also graze livestock on USFS administered lands. That use typically occurs in the summer.

A proposal for interchange of management between BLM and USFS federal lands was announced to the public on January 30, 1985. Under the interchange proposal, all present planning efforts would be continued, even though agency jurisdiction may change in the future.

Steelhead Falls, 3,114 acres of public land adjacent to the Deschutes River northwest of Redmond, is being considered for possible wilderness designation. It is being studied jointly by the BLM and Ochoco National Forest. Its suitability for wilderness will be addressed in the Forest Service's Ochoco Forest Plan/EIS. A draft of that plan is expected in September 1985.

The BLM, the USFS, the Oregon Department of Fish and Wildlife and the Confederated Tribes of the Warm Springs Indian Reservation are working to improve aquatic habitat in the Deschutes River watershed within the planning area. The agencies are also working to improve habitat in the John Day River watershed.

Cooperative work is continuing with the Oregon Department of Fish and Wildlife, U.S. Forest Service, Confederated Tribes of the Warm Springs Indians, Columbia River Intertribal Fish Commission, National Marine Fisheries Service, Northwest Power Planning Council, U.S. Soil Conservation Service, U.S. Fish and Wildlife Service and U.S. Bureau of Reclamation in implementing riparian improvement projects.

The National Park Service administers the John Day Fossil Beds National Monument adjacent to some tracts of public land.

The U.S. Fish and Wildlife Service administers the Endangered Species Act of 1973 (as amended). The BLM consults with that agency when it is determined that a threatened or endangered species, or its critical habitat may be affected to obtain a formal biological opinion on appropriate courses of action. Resulting decisions could mean the proposed action is modified or abandoned.

The BLM has working relationships with many agencies dealing with common resource management or resource concerns. Cooperative activities have been accomplished with the U.S. Soil Conservation Service in developing coordinated resource management plans and the collection of resource data. The BLM and the Bonneville Power Administration (BPA) coordinate resource management programs through a memorandum of understanding. The memorandum allows regional and district coordination where similar interests exist in water resources and major utility corridors. The BLM, the BPA and the Northwest Power Planning Council (NPPC) are involved in stabilization and improvement of riparian zones, anadromous fish habitat as authorized by the National Power Planning Act, and aquatic habitat through grants provided by the BPA. The BPA also assists the

BLM in identifying and evaluating regional utility corridor options.

The Federal Energy Regulatory Commission reviews proposals for new powersites within the Two Rivers Planning Area.

2. State and Local Governments

The BLM and the Oregon Department of Fish and Wildlife (ODFW) work closely on site specific activities to develop resources of interest to both agencies. The ODFW and the BLM have a cooperative management agreement in the White River Game Management Area. The ODFW also works with the BLM in supervising and controlling livestock grazing, vegetation monitoring and evaluation, and the installation of range and wildlife improvements. The consistency of the alternatives analyzed in this plan with the State of Oregon wildlife goals are presented in Table 3.

The BLM is part of an interagency management group which coordinates recreation management responsibilities on the Deschutes River. Other agencies participating in addition to the BLM are the State Parks and Recreation Division of the Department of Transportation, the ODFW, Oregon State Marine Board and the Confederated Tribes of the Warm Springs Indian Reservation.

The BLM Prineville District works cooperatively with the Oregon Department of Forestry (ODF) in fire suppression activities on public lands. Prescribed burning will be scheduled in cooperation with adjacent landowners and the ODF. BLM also coordinates with ODF and private landowners for forest harvest techniques and silvicultural practices.

The ODF, through administration of the Forest Practices Act of 1972, regulates timber harvest operations and supportive practices on all nonfederal lands within the Two Rivers Planning Area. Minimum standards are prescribed as they relate to these specific forest practices:

- Timber harvest
- Reforestation of economically suitable lands
- Road construction and maintenance on forested lands
- Chemical applications
- Slash disposal
- Maintenance of streamside buffers

The BLM has entered into a memorandum of understanding with the State Department of Forestry on minimum standards for the above actions. The consistency of the alternatives analyzed in this plan with the basic objectives of the forestry program for Oregon are presented in Table 3.

The BLM cooperates with the various soil and water conservation districts to establish mutual goals in coordinating range and watershed practices and to gather and share natural resources information that has proven beneficial for use on public and private lands. Cooperation with appropriate weed control districts also occurs as needed to deal with infestations of noxious weeds.

Under Section 202 of the Federal Land Policy and Management Act all BLM plans must be consistent, insofar as possible, with resource related plans officially approved or adopted by State and local agencies, and with plans, policies and programs of Federal laws and regulations. Lands in Crook, Gilliam, Hood River, Jefferson, Sherman, Wasco and Wheeler counties are included in the Two Rivers Planning Area. The comprehensive plans for these counties have been acknowledged by the Oregon Land Conservation and Development Commission and are in conformance with statewide planning goals and objectives. The public lands within the planning area are in "exclusive farm use" or "forestland" zones. Proposed BLM land uses are compatible with the county plan guidelines for these zones, including emphasis on natural values, livestock grazing, forest practices, including timber harvest, cultural, visual and recreation resource protection or enhancement.

The county plans vary on minimum lot size for residences. The sale of small parcels of public land would not violate county plans because the new owners would still be subject to county zoning requirements in obtaining building permits. Table 4 shows the relative consistency of each alternative with county plans and programs. Both State and local planning are considered during the development of plans for the public lands.

3. Individuals and Groups

There are more than seven million acres of private land within the boundaries of the Two Rivers Planning Area. These lands comprise more than 90 percent of the surface ownership. Public lands, managed by the BLM, comprise approximately 4 percent. Management coordination is therefore essential if the intermingled tracts are to be managed properly. Where the BLM has primary management responsibility, the allotment management plan will normally be sufficient to assure coordination with adjacent landowners. On allotments with multiple ownership, however, the development of a Coordinated Resource

Table 3 Consistency of the Alternatives with State of Oregon Wildlife Goals and Basic Objectives of the Forestry Program for Oregon[1]

Wildlife Goal	Discussion
1) To maintain all species of wildlife at optimum levels and prevent the serious depletion of any indigenous species.	All alternatives are consistent with the objective: Maintaining or achieving maximum wildlife species diversity through habitat diversity and preventing any depletion of species with proper management.
2) To develop and manage the lands and waters of the State in a manner that will enhance the production and public enjoyment of wildlife.	Habitat improvement for the upland, riparian and aquatic habitats in Alternatives A, B, D and E are consistent with the objective. Alternative C would maintain the present situation without any planned development to improve.
3) To regulate wildlife populations and the public enjoyment of wildlife in a manner that is compatible with primary uses of the land and waters of the state and provides optimum public recreation benefits.	Alternatives A, B, D and E are consistent with the objective by improving habitat diversity and increasing wildlife species diversity, which would enhance the quality of public enjoyment of wildlife. Alternative C would maintain the existing situation.
4) To develop and maintain public access to the lands and waters of the State and the wildlife resources thereon.	Alternatives A, C, D and E would restrict ORV use in areas that would have adverse impacts to wildlife species. Alternative B would be consistent with the objective in developing or maintaining public access, although wildlife disturbances could occur.
5) To permit an orderly and equitable utilization of available wildlife.	All alternatives are consistent with this objective. Limited access and ORV use could restrict opportunities into areas under all alternatives.

Basic Forestry Objective	Discussion
To maintain the maximum commercial forest land base consistent with resource uses while assuring environmental quality.	Alternatives A through D are consistent with the commercial forest land base (suitable for timber production) benchmark of approximately 11,000 acres. Alternative E is not consistent. Environmental quality protection measures would meet or exceed requirements of the Oregon Forest Practices Act.
To maintain or increase the allowable annual harvest level to its fullest potential to offset potential socioeconomic impacts.	Alternatives A through D are consistent with the annual sustainable harvest benchmark of 1.43 MMbf. Alternative E is not consistent. The level of harvest the land base can sustain is dependent on the productivity of the land, the level of management the land base receives, and the number of acres allocated to other resource values.
To identify and implement the levels of intensive forest management required to achieve maximum growth and harvest.	Alternatives A through D would allow for a full range of intensive timber management practices to get maximum timber production. New and improved practices would be used, consistent with technological advances. Alternative E would preclude such activity.
To maintain community stability by remaining flexible for increases in future harvest levels that would offset projected shortages.	Annual harvest levels ranging between 1.41 MMBF and 1.45 MMbf would not affect community stability within the planning area. A reduction in the annual harvest level to 0.2 MMbf could possibly cause a minor effect if timber shortages occur.

[1]Based on the Oregon State Department of Forestry, Forestry Program for Oregon, published in 1977 and updated in 1982.

Management Plan (CRMP) could provide a better resolution of livestock management and other resource objectives. A CRMP could involve several agencies and a variety of landowners.

4. Coordination and Consistency with Other BLM Plans

Public lands south of the Two Rivers Planning Area are located in the Brothers Planning Area. A land use plan and grazing environmental impact statement for the Brothers Planning Area was completed in 1982. The preferred alternative in the draft Two Rivers RMP/EIS is consistent with the decisions contained in the Brothers Land Use Plan and Grazing Management Plan.

This RMP/EIS will coordinate site specific planning and activities with the adjacent Burns and Vale BLM Districts when needed.

5. Relationship of the Preferred Alternative and Other Alternatives to Tribal Treaties

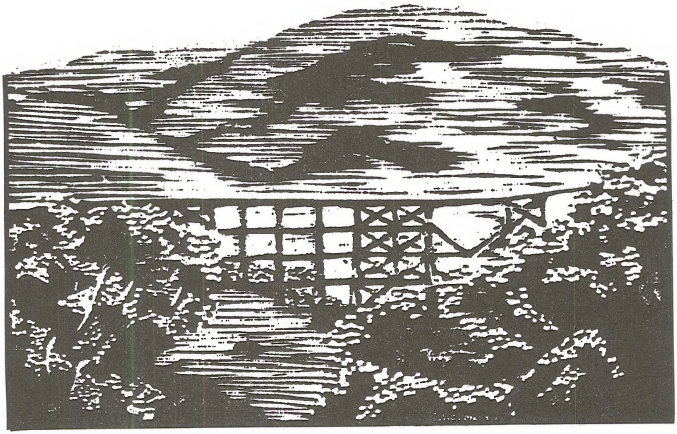
The entire Two Rivers Planning Area was ceded to the U.S. Government by the Confederated Tribes of Warm Springs through ratified treaty. The treaty reserves to the Indians the rights for hunting, fishing and gathering in usual and accustomed locations, and grazing of stock on unclaimed land. The interests of contemporary Native Americans include the protection of Indian burial grounds and the perpetuation of certain traditional activities, specifically root gathering and fishing.

Table 4 Relationship of the Preferred and Other Alternatives to County Comprehensive Plans as they Incorporate and Reflect Statewide Land Conservation and Development Goals[1]

LCDC Statewide Goal Number and Description	Discussion
1. To ensure citizen involvement in all phases of the planning process.	BLM's land use planning process provides for public input at various stages. Public input was specifically requested in developing the Preferred Alternative, other alternatives, issues, and planning criteria described in the RMP/EIS. Public input will continue to be utilized in the environmental analysis process and development of the final RMP.
2. To establish a land use process and policy framework as a basis for all decisions and actions.	The Preferred Alternative and other alternatives have been developed in accordance with the land use planning process authorized by the Federal Land Policy and Management Act of 1976 which provides a policy framework for all decisions and actions.
3. To preserve and maintain agricultural lands.	The vast majority of public lands in the planning area are not suitable for intensive agriculture. Alternatives A,B,C and D provide for continued use of small tracts of public lands for intensive agriculture either through lease or land sales. The sale of small parcels in Zone 2 or 3 and some exchanges could lead to new owner requests for non-agricultural (non-grazing) use of lands previously in public ownership. Since the new owner would be subject to county plan and building permit requirements, it is assumed that the sale of public land and exchanges would not, in themselves, violate county plans.
4. To conserve forestlands for forest uses.	The planning area has limited acreages of commercial forestland or juniper woodlands. Alternative B would increase wood products production very slightly. Alternative C would retain current management direction with no change in timber production. The other alternatives could cause a slight reduction in timber harvest levels but would protect other forest values.
5. To conserve open space and protect natural and scenic resources.	Natural and visual resources were considered inthe developmentofthe Preferred Alternative and other alternatives. Forest product sales, forest development, fencing and vegetation manipulation projects under the Preferred Alternative and other alternatives would impact open space as well as natural and visual resources. Adverse impacts to visual resources, wildlife habitat, and unique natural areas are greatest under Alternative B and least under the alternatives (D and E) where natural values are emphasized.
6. To maintain and improve the quality of the air, water and land resources.	The Federal and State minimum water quality standards would be met and water quality would be maintained and/or improved under all alternatives. Prescribed burning for brush control under Alternatives A,B,D and E and broadcast burning of logging slash under all alternatives would have a slight temporary affect on air quality at upper atmospheric levels. All alternatives would comply with the statewide smoke management plan.
8. To satisfy the recreational needs of the citizens of the State and visitors.	The BLM actively coordinates its outdoor recreation and land use planning efforts with those of other agencies to establish integrated management objectives on a regional basis. Under the Preferred Alternative and all other alternatives, opportunities would be provided to meet recreational needs. The quantity of recreational opportunities would be greatest under Alternatives A, B, D and E. The quality of certain types of recreational opportunities would be greatest under Alternatives D and E. Levels of recreation use would be greatest under Alternative B.
9. To diversify and improve the economy of the State.	Alternatives A, B, C and D would induce economic stability or gains in the long term through livestock forage production, mineral exploration, and/or timber harvesting. This would result in a slightly improved local and State economy.
13. To conserve energy	Conservation and efficient use of energy sources are objectives in all BLM activities. Use of cull logs and slash for chips and firewood is encouraged. Sale and harvest of minor forest products (e.g., posts, poles, firewood) from woodlands and non-commercial forest areas is permitted in most areas.

[1]Statewide goals, 7, 10, 11, 12 and 14 are not generally applicable to all alternatives. Goals 15-19 are not applicable to the counties within the Two Rivers Planning Area.

Chapter 2 Description of Alternatives, Including the Preferred Alternative



Old railroad trestle at Gordon Canyon

Alternatives to be Analyzed/Eliminated from Detailed Study

Several alternatives were considered in addressing specific issues in the Two Rivers Planning Area, but were eliminated. Those alternatives were unconstrained in the production or protection of one resource at the expense of others. They were not considered appropriate because the proposed management systems would violate the BLM's legal mandate to manage public land on the basis of multiple use and sustained resource yield. They would also violate one or more federal laws or executive orders regarding protection of various resources (i.e. air, or water quality, or cultural resources).

National Environmental Policy Act (NEPA) regulations and BLM resource management planning regulations both require formulation of alternatives. One alternative must represent "No Action." That means to continue present levels or systems of resource use. The other alternatives are aimed at providing choices ranging from those favoring resource protection to those favoring resource production. The basic RMP/EIS alternatives are designed to identify combinations of public land uses and resource management practices that respond to planning issues. Alternatives to resolve most planning issues, such as forest management, were reached by placing varying degrees of emphasis on resource protection (e.g., riparian management) or on resource production.

Five alternatives are considered in detail in this document. Four of them (Emphasize Commodity Production and Enhancement of Economic Benefits; Continue Existing Management-No Action; Emphasize Natural Values While Accommodating Commodity Production; and Emphasize Natural Values) were developed to explore a range of ways in which issues could be resolved. This approach is required by regulations of the Council of Environmental Quality and by BLM planning policy. A fifth alternative, the Preferred Alternative, incorporates parts of the other alternatives. General goals and objectives of each of the alternatives are listed in Appendix D.

Rationale for Selection of the Preferred Alternative

The preferred alternative best meets policy guidance, best satisfies the planning criteria and best resolves the eight identified issues. It represents balanced conflicts and tradeoffs between land uses while protecting non renewable and/or natural values.

Implementation of the preferred alternative is designed to accomplish the following:

1. Maintain current levels of forage availability for livestock.

2. Achieve at least 60 percent of vegetative potential in all riparian areas.

3. Achieve high mid seral to low late seral ecological condition where possible on all upland vegetation to meet or exceed wildlife objectives within 20 years.

4. Provide for land exchanges, transfers, sales, authorization of agricultural use and acquisition of public access. Identified land ownership adjustments would result in improved management efficiency, fewer conflicts between the public and private landowners, and greater public benefits through improved access opportunities. The result would also mean more productive use by transfer of some public land by placing it into private or local government ownership.

5. Provide a sustainable annual harvest level of timber without exceeding acceptable levels of adverse impacts to other resource values.

6. Allow exploration and development of mineral resources consistent with BLM policy, while protecting other significant values.

7. Provide management for a variety of primitive and dispersed recreational activities with a continued emphasis on the minimum possible impact on public land resources.

8. Provide for the protection and management of all identified special management areas.

Management Guidance Common to All Alternatives

The following management guidance is applicable to all alternatives considered in detail. It is presented here to avoid repetition.

Wilderness

The Bureau's Interim Management Policy, as it relates to the five areas being considered for

wilderness designation, will be adhered to in all cases. Possible designation of these areas as wilderness will be recognized in all land use decisions.

Recreation Use of the Deschutes River

Recreation management on the Deschutes River will be recognized in decisions related to other resources that may also affect the quality or quantity of recreation river use (e.g. riparian management, or access).

Recreation Use of the John Day River

Decisions related to resources in the John Day River Canyon will recognize the possible effects on recreation river use (e.g. riparian management, or access). Plans for management of recreation river use will be fully integrated with the intent and purpose of this RMP/EIS.

Wildlife and Fish Habitat Management

General

The significance of proposed projects such as timber sales, mineral exploration etc. and the sensitivity of fish and wildlife habitat in the affected area would be considered. Appropriate stipulations would be included to assure compatibility of the project with management objectives for fish and wildlife habitat.

Under alternatives where habitat improvement projects are proposed, they would include streambank stabilization using fencing, juniper tree placement, rock riprap and rock jetties, log and rock placement, gabion development, and tree and shrub plantings.

Seasonal Restrictions

Continued seasonal restrictions would be applied to mitigate impacts of human activities on important seasonal wildlife habitat. Some important types of habitat include crucial deer winter range, raptor nesting habitat, and curlew nesting habitat.

Threatened, Endangered or Sensitive Species Habitat

No activities would be permitted in the habitat of threatened or endangered species that would jeopardize the continued existence of such species. Management activities in the habitat of threatened or endangered and sensitive species would be designed specifically to benefit those species through habitat improvement.

The Oregon Department of Fish and Wildlife (ODFW) and the U.S. Fish and Wildlife Service (USFWS) would be consulted before implementing projects that may affect habitat for threatened or endangered species. If an adverse situation for threatened or endangered species is determined through the BLM biological assessment process, then formal consultation with the USFWS would be initiated under Section 7 of the Endangered Species Act of 1973, as amended.

Terrestrial Wildlife Habitat

Sufficient forage and cover would be provided for wildlife on important habitat to maintain existing population levels or management objective levels as established by the ODFW. Specific forage and cover requirements would be incorporated into allotment management plans in areas of primary wildlife use.

Range developments would be designed to achieve both wildlife and range objectives. Existing fences may be modified, and new fences would be built to allow wildlife passage. Where natural springs exist, development would provide a more dependable water source for wildlife and livestock. Water troughs would accommodate use by wildlife and livestock. The spring area and the overflow would be fenced to exclude livestock trampling.

Vegetative manipulation projects would be designed to minimize wildlife habitat impact and to improve habitat when possible. The ODFW would have an opportunity to review all projects involving vegetation manipulation.

Riparian and Aquatic Wildlife Habitat

Management actions within riparian areas would include measures to protect or restore natural functions, as defined by Executive Orders 11988 and 11990. Management techniques would be used to minimize degradation of stream banks and the loss of riparian vegetation. Bridges and culverts would be designed and installed to maintain adequate fish passage. Roads and other linear facilities would avoid riparian areas where practicable. Riparian habitat needs would be considered in developing livestock grazing systems and pasture designs.

Trout Creek near Ashwood

Proposed wildlife reintroductions and fish stocking by ODFW would be evaluated and recommendations made by the BLM. BLM policy requires that a Habitat Management Plan (HMP) be prepared before any wildlife species is reintroduced.

Livestock Grazing

Allotment Categorization

All grazing allotments in the planning area have been assigned to a management category based on present resource conditions, potential for improvement, economic feasibility of range developments, and land ownership patterns as they affect manageability by BLM. The categorization process is designed to establish allotment priorities so management efforts and funding can be directed to areas of greatest need. The three categories are I (Improve), M (Maintain), and C (Custodial).

The I allotments are usually areas with a potential for resource improvement where the BLM controls enough land to implement changes. Some I allotments are under intensive management planning cooperatively developed by all landowners in the allotment. Most of the I allotments are within the main John Day and Deschutes river corridors.

The M Allotments are usually where satisfactory management has already been achieved through management efforts of the users, conservation plans, coordinated resource management plans, or cooperative agreements with adjoining landowners. In some cases, M allotments may not be under the best possible management, but BLM ownership in those cases, while substantial, is not dominant. Most of the C allotments are small, unfenced tracts intermingled with larger acreages of non BLM rangelands, thus limiting BLM management opportunities.

All allotments, regardless of category, are addressed as shown in Appendix E.

Implementing Changes in Allotment Management

Where management changes are needed, those changes, a schedule for implementation, and agreement of the party(ies) will be documented. Documentation can be as simple as an agreement where the livestock operator agrees to a specified amount of grazing use on public land within the allotment. In more complex situations an Allotment Management Plan (AMP) may be developed to establish grazing systems, seasons of use, numbers of livestock, and range developments and treatments designed to meet documented, quantifiable resource objectives.

A Coordinated Resource Management Plan (CRMP) may be developed in areas where there are multiple landowners (private, county, State, and Federal) and/or where there may be concerns/problems for which an interdisciplinary approach would provide better technical assistance.

Monitoring

Range management practices will be monitored to determine if resource objectives are being met. No changes in livestock forage use (except due to loss of land base) will be made unless they can be substantiated through monitoring studies. If monitoring shows objectives are not being met, the activity plan will be modified as needed. Monitoring studies are described in Appendix F.

Grazing Systems

The particular system for a given allotment specified in an activity plan would depend on resource characteristics of the allotment, the resource objectives, the needs of the operator(s) and associated implementation costs.

Typical grazing treatments, systems available for consideration and the general effects of each system are described in Appendix G.

Rangeland Developments

Design features and standard operating procedures for range developments are discussed in Appendix H.

Unleased Tracts

Unleased tracts generally would remain available for authorized grazing, as provided in BLM grazing regulations (43 CFR 4110 and 4130). Grazing use applications would generate site specific analyses to determine when grazing would be allowed, as well as the kind and amount of grazing.

Noxious Weed Control

Infestations of noxious weeds are known to occur on some public lands in the planning area. The most common noxious weeds are diffuse, spotted and Russian knapweed, yellow star thistle, dalmation toadflax, and poison hemlock. Control methods would be proposed and subjected to site specific environmental analyses. Control methods would not be considered unless the weeds are confined to Public lands or control efforts are coordinated with owners of adjoining infested, non Public lands. Proper grazing management will be emphasized after control to minimize possible reinfestation.

A multi state BLM environmental impact statement on noxious weed control is being prepared for Oregon, Washington, Idaho, Montana and Wyoming. Copies will be available through the Prineville District Office when it is completed.

Threatened or Endangered Plant Species

Before any vegetative or ground manipulation is allowed, the BLM requires a survey of the project site for plants listed or proposed for listing as threatened or endangered species, or its critical habitat. Every effort would be made to modify, relocate, or abandon the project to obtain a "no effect" determination. If the BLM determines that a project cannot be altered or abandoned, consultation with the U.S. Fish and Wildlife Service (USFWS) would be initiated (50 CFR 402; Endangered Species Act of 1973, as amended).

Fire Management

The main emphasis of a fire management program in the Two Rivers Planning Area will continue to be prevention and suppression of wildfire to protect public values such as timber, vegetation, visual resources and adjacent private property. Prescribed fire would be used under four of the five alternatives to reach multiple use objectives. When prescribed fire is considered under various programs it will be coordinated with the Oregon Department of Forestry and adjacent landowners and carried out in accordance with approved fire management plans and appropriate smoke management goals and objectives.

Forestry

Fundamental procedures developed to protect soils, wildlife and fisheries habitat, riparian vegetation, water quality, and cultural and visual resources would be used in all practices. More discussion on this can be found in Appendix I. Also, forestry practices would be guided by site specific environmental analyses. Maintaining or improving site productivity would be a basic objective in all forestry practices. Harvesting minor forest products such as posts, poles, firewood, etc., would be guided by similar considerations.

Decisions on forestry practices (treatments) would be made with two primary objectives: (1) Successful reforestation; and (2) Increasing subsequent growth of commercial species. In this process, specific mitigation recommendations would be used to minimize unavoidable, adverse impacts and to resolve conflicts with other resource values.

Energy and Minerals

Locatable Minerals

Mineral exploration and development on public land will be regulated under 43 CFR 3809 to prevent unnecessary and undue land degradation.

Leasable Minerals

Leasable minerals would continue to be made available on most of the land where the surface is also publicly owned. Restrictions or changes in lease stipulations proposed under the various alternatives would apply only to areas not presently leased or areas presently leased where leases will be renewed. Leases would not be granted on 12.5 acres of public lands within the Governor Tom McCall Preserve; two parcels of public land totaling 76 acres within the Columbia Gorge; 250 acres of public lands within the proposed Island Research Natural Area; and 2,617 acres of public lands within The Cove Palisades State Park.

Salable Minerals

Salable minerals, including common varieties of sand, gravel, and stone would continue to be made available for local governments. The salable mineral program involves several quarries where State and County road departments obtain rock for road surfacing material. New quarry sites may be developed as needed if they are consistent with the protection of other resource values.

Old rock shelter on the banks of the Deschutes River

All public lands are open to recreational mineral collection unless specific minerals are subject to prior rights, such as mining claims.

Reserved Federal Mineral Estate

The reserved Federal mineral estate will continue to be open for mineral development. Conveyances of mineral interest owned by the United States, where the surface is, or will be, in non Federal ownership, may be enacted after a determination is made under Section 209(b) of FLPMA finding:

(1) That there are no known mineral values in the land, or

(2) That the reservation of mineral rights in the United States would interfere with or preclude non

mineral development of the land and that such development is a more beneficial use of the land than mineral development.

All land tenure adjustments will consider the effect on the mineral estate. If the lands are not known to have mineral development potential, the mineral interest will normally be transferred simultaneously with the surface.

Lands Program

Land Tenure and Access

Public lands in the Two Rivers Planning Area have been placed into three major zones as shown on Map 3 with acreages by county listed in Table 5. Zone 1 was delineated to include lands which have been identified as having national or statewide significance. Included were the Deschutes River National Recreation Lands, Governor Tom McCall Preserve, Deschutes and John Day State Scenic Waterways, Columbia River Gorge, the five identified areas under consideration for wilderness designation, the White River Canyon, the lower Crooked River, the White River Game Management Area, The Dalles Watershed and the Horn Butte long billed curlew nesting area. These lands possess significant visual, wildlife, watershed, wilderness, recreation, vegetative and/or cultural values.

Public lands in Zone 2 were identified as those with potentially high resource values for timber, recreation, riparian, watershed, cultural and/or wildlife.

Public lands in Zone 3 are scattered, isolated tracts with unknown resource values. They are lands potentially suitable for disposal if significant recreation, wildlife, watershed, threatened or endangered species, and/or cultural values are not identified. Those public lands which may be considered for disposal are listed in Appendix J.

Rights of Way/Recreation and Public Purposes

Public lands will continue to be available for rights of way, including multiple use and single use utility/transportation corridors following existing routes, communication sites, and roads. Issuance of leases and/or patents under the Recreation and Public Purposes Act and other permits or leases for development of public lands will also continue. Applications will be reviewed on an individual basis for conformance with the Two Rivers RMP/EIS so as to minimize conflicts with other resources or users.

Table 5 Public Land Zones and Acreage by County

County	Zone 1	Zone 2	Zone 3	Total Acreage
Hood River	0	0	360	360
Wasco	46,109	18,154	7,161	71,424
Sherman	47,822	5,353	1,401	54,576
Gilliam	40,883	6,412	5,618	52,913
Wheeler	25,607	54,310	15,240	95,157
Jefferson	20,459	21,555	3,830	45,844
Crook	0	4,431	0	4,431
Totals	180,880	110,215	33,610	324,705

Withdrawal Review

Review of other agency withdrawals will be completed by 1991. These withdrawals may be continued, modified, or revoked. Upon revocation or modification, part or all of the withdrawn land may revert to BLM management.

Utility and Transportation Corridors

All utility/transportation corridors identified by the Western Regional Corridor Study of May 1980, prepared by the Ad Hoc Western Utility Group, would be designated without further review. The corridors are displayed on Map 10.

All rights of way applications will be reviewed using the criteria of following existing corridors wherever practical and avoiding proliferation of separate rights of way.

Land Sales

Sales of public land are conducted under the authority of Section 203 of the Federal Land Policy and Management Act of 1976 (FLPMA) which requires that one of the following conditions exist before land is put up for sale: (1) Such tract, because of its location or other characteristics, is difficult and uneconomical to manage as part of the public lands, and is not suitable for management by another Federal department or agency; or (2) Such tract was acquired for a specific purpose and the tract is no longer required for that or any other Federal purpose; or (3) Disposal of such tract will serve important public objectives, including but not

limited to, expansion of communities and economic development, which cannot be achieved prudently or feasibly on land other than public land and which outweigh other public objectives and values, including, but not limited to, recreation and scenic values, which would be served by maintaining such tract in Federal ownership.

Land Exchanges

Exchange of public land under Section 206 of FLPMA requires: (1) A determination that the public interest will be well served by making an exchange; (2) Lands to be exchanged are located in the same state; and (3) Exchanges must be for equal value but differences can be equalized by payment of money by either party not to exceed 25 percent of the total value of the lands transferred out of Federal owhership. Exchanges will be made only when they would enhance public resource values and only when they improve land patterns and management capabilities of both private and public lands within the planning area by consolidated ownership and reducing the potential for conflict land use.

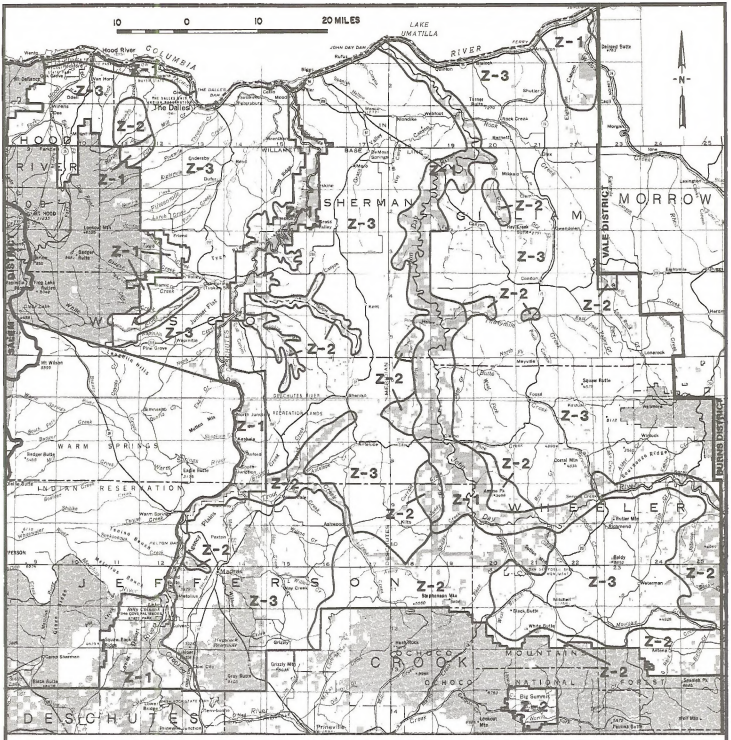
Visual Resources

Before the BLM initiates or permits any major surface disturbing activities on public lands, an analysis will be completed to determine adverse effects on visual qualities. Activities that would result in significant, long-term adverse effects on the visual resources of the John Day or Deschutes River canyons in areas normally seen from these rivers would not be permitted.

Activities within other areas of high visual quality that could be seen may be permitted if they would not attract attention or leave long term adverse visual changes on the land. Activities in other areas may change the landscape but would be designed to minimize any adverse effect on visual quality.

Requirements for Further Environmental Analysis

This environmental impact statement may best be described as a programmatic statement for the Two Rivers Planning Area. Site specific environmental analysis and documentation (including categorical exclusion where appropriate) will be accomplished for each proposed project. Interdisciplinary impact analysis will be tiered within the framework of this and other applicable environmental impact statements.



Z-1 Areas currently identified as having high public resource values

Z 2 Areas with potential for high public resource values

Z-3 Areas with public lands which may be suitable for disposal through transfer to another agency, exchange or public sale

U. S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
PRINEVILLE DISTRICT
1985

MAP 3
Land Tenure

Management Direction by Alternative

The components of each resource program are summarized by alternative, showing management emphasis. Attention is directed to the differences between the alternatives.

Alternative A (Preferred Alternative)

Wildlife
Livestock use on approximately 18,000 acres of deer and elk winter range and 7,500 acres of curlew nesting habitat would be managed to be compatible with, or improved, wildlife habitat values. Upland vegetation would be managed through grazing management and rangelwildlife habitat development to achieve maximum wildlife species diversity (ecological condition of high mid seral to low late seral stage) and to provide sufficient forage to meet the big game management objectives of the Oregon Department of Fish and Wildlife.

Fish habitat developments on approximately 97 miles of tributary streams include: log and rock placements; gabion developments; tree and shrub plantings; and riparian habitat improvement used to achieve a good to excellent aquatic habitat condition. The fish habitat developments would be concentrated on the tributary streams of the Deschutes and John Day rivers. They would not include direct instream improvements in the main river channels.

Livestock Grazing Management
The availability of forage would remain at 17,778 AUMs in the short term. Sixty miles of fence would be constructed, approximately 7,600 acres of sagebrush would be controlled through prescribed burning and 13 springs would be developed. As a result of range developments and improving ecological condition, available forage for livestock would be increased to 19,920 AUMs in the long term. Appendix K lists the changes in available forage. A listing of the developments proposed for each allotment under Alternative A is included in Appendix L. Livestock use in the Horn Butte (2571) and Hi Meadows (2644) Allotments would be managed to enhance habitat for the long billed curlew.

Changes in periods of use or exclusion through construction of 131 miles of riparian protection/exclusion fence, or a combination of both would occur where necessary to meet objectives of this alternative. Table 6 shows grazing systems by allotment category for each alternative. Intensive management, which would encourage a change in ecological condition toward climax, would be implemented on 259,000 acres. On the remaining 34,000 acres there would be less intensive management which would either improve or maintain existing conditions.

Riparian
All riparian areas along the Deschutes and John Day rivers and their major tributaries would be managed to reach full potential, with a minimum of 60 percent of the vegetative potential to be achieved within 20 years. Proposed riparian fencing would exclude 244 miles (984 acres) of additional riparian vegetation, primarily on the John Day River and on streams that are tributary to both rivers. Livestock grazing would be managed to reach the stated riparian objectives on the remaining 37 miles (76 acres) of riparian vegetation. Riparian vegetation currently excluded is shown under Alternative C.

Forestry
An average annual sustainable timber harvest level of approximately 1.41 MMbf would occur from an intensive production base of 10,715 acres. Table 7 shows estimated acreages, by management practices, that would receive treatment over a decade, based on this harvest level. Management practices would be designed to recognize harvest restrictions for the protection of riparian vegetation, wildlife, cultural or other natural values.

Minor forest products, such as posts, poles, firewood, etc., would be sold where those sales are compatible with other resource values.

Exploration and Development of Mineral Resources
The public lands would remain open for exploration and development of mineral resources and related rights of way. Fluid mineral leasing:
would continue, with the entire Federal reserved mineral estate and approximately 198,000 acres of public land open to exploration—subject to standard lease requirements and stipulations. Competitive leasing options for each alternative are shown in Table 8.

A restrictive no surface occupancy (NSO) stipulation for fluid minerals exploration and development would be maintained on 132,000 acres of public lands in the planning area—lands identified as nationally significant or visually sensitive.[1]

Exceptions to the stipulation of no surface occupancy would be evaluated using the following criteria:

(1) Evidence of exploration or similar activities would not be visible from the surface of either the John Day River or the Deschutes River. Activities within other areas of the river corridors may be visible, but would not attract attention, or leave long term visual impacts.

(2) All activities involving exploration would use existing roads to the fullest extent possible.

(3) Any proposed exploratory drilling pad or road construction for access to a drilling site would be sited to avoid canyon slopes and areas of high visibility. In these areas roads and drilling sites would be fully rehabilitated when operations have been completed.

If a discovery of mineral resources is made, alternatives for mineral development and their relationship to the public land and other resources within the area will be addressed.

Land Tenure and Access

Exchange, Transfer or Sale
The preferred method of disposal would be through exchange to achieve goals of public value enhancement in all three zones. The transfer of public lands to other public land management agencies would occur if more efficient management of the land would result. Public lands located in Zone 3 on Map 3 would be considered for sale (totaling 33,610 acres) if no apparent exchange opportunity exists and if no significant resource values are identified. Appendix J lists the potential land disposal tracts in Zone 3. This could average as much as 1,000 acres per year. Public lands in Zone 1 would be retained, or could be exchanged for lands with even higher public value. Lands in Zone 2 would require further study to determine sale potential.

Agricultural Use of Public Lands
Public lands with agricultural potential would be considered for sale if they met the sale criteria. Existing and potential agricultural use of public lands in the planning area would be authorized by permit or lease if the following criteria would be met:

(1) The use does not conflict with riparian area management, important wildlife habitat, recreational use of public lands, or other significant resource values,

(2) The use is compatible with historical use on adjacent private lands,

(3) The use would maintain or enhance other resource values, such as providing feeding or nesting areas for wildlife.

Agricultural use would be permitted on an estimated 450 acres and 300 acres now under cultivation would be reclaimed. Private appropriation of water from the John Day River as it relates to agricultural use on adjacent public lands would be coordinated through the Oregon Department of Fish and Wildlife, the Oregon Water Resources Board, and the Oregon State Parks and Recreation Division of the Department of Transportation.

When significant conflicts occurred, resource values on public lands would be protected and agricultural use would not be authorized.

Public Access
Additional public access may be acquired to serve tracts in Zones 1 and 2 if access is consistent with management objectives. Where public access is desired, the minimum access needed to achieve management objectives would be acquired. The preferred method would be through negotiated purchase of an easement or exchange.

Recreation
Public lands would be open to off road vehicle use, except in areas where significant damage to soils, vegetation, wildlife, or visual resources is resulting from ORV use. An estimated 20,000 acres of public land would be limited or closed to ORV use.

Collectible mineral resources with moderate or high value, including plant and invertebrate fossils, would be available for rockhounding and recognized in land use decisions. Public use areas would be reviewed on a case by case basis to insure that no significant conflict existed with the protection of other natural values.

Special Management Areas
Under this alternative, 13 special management areas would be managed as follows:

The Island in The Cove Palisades State Park
Designate and manage 260 acres of public land as a Research Natural Area (RNA). This would include 80 acres of USFS land and would necessitate a cooperative management agreement.

Deschutes and John Day River Canyons (Including the Red Wall)
Continue managing areas of high visual and natural quality in the canyon areas while allowing other compatible uses in the same area. Continue cooperative role with the State Parks and Recreation Division of the Oregon Department of Transportation in managing the public lands, consistent with the intent of the Oregon Scenic Waterways Act.

John Day River State Wildlife Refuge, Horn Butte Curlew Area and White River Wildlife Areas
Incompatible uses would be excluded from these areas. They would be managed to meet forage and habitat needs for big game and non game species as recommended by the Oregon Department of Fish and Wildlife. The Horn Butte Curlew Area would be designated as an Area of Critical Environmental Concern (ACEC).

The Dalles Watershed
Continue management agreement with the City of The Dalles. Surface disturbing activities would be excluded if they have an adverse effect on the watershed.

The Governor Tom McCall Preserve at Rowena and the botanical/scenic areas within the Columbia Gorge.
Designate 12.5 acres within the Governor Tom McCall preserve as a Research Natural Area. The important botanical and scenic qualities of 76 additional acres (in two parcels) outside this preserve, but within the Columbia Gorge, would also be preserved with a designation as an Outstanding Natural Area.

Historic Spanish Gulch Mining District
The Spanish Gulch Mining District would be designated as an Area of Critical Environmental Concern to protect and maintain significant historical values.

The Oregon Trail Historic Sites at Fourmile Canyon and McDonald and the Macks Canyon Archeological Site
The unusual qualities of these sites would be maintained and protected. Intensive management plans, as well as public information and interpretive plans would be developed for these areas.

[1]The restrictive no surface occupancy stipulation reads as follows: "Because of the high scenic and recreational values, no surface occupancy is allowed on the part of the lease falling within the John Day River canyon or the Deschutes River canyon, unless written permission is granted by the BLM Deputy State Director for minerals, with the consent of the Prineville BLM District Manager."

Alternative B (Emphasize Commodity Production and Enhancement of Economic Benefits)

Wildlife
Existing habitat management plans would be continued. Efforts to improve fish habitat condition to 60 percent of potential would occur.

Livestock Grazing Management
Eighty one miles of fence would be constructed to exclude livestock from riparian areas. Changes in period of use, exclusion, or a combination of both would occur where necessary to meet riparian objectives. Intensive management, which would encourage change in ecological conditions toward climax, would be implemented in 259,000 acres. On the remaining 34,000 acres, there would be less intensive management which would either improve or maintain existing conditions.

Forage available for livestock would be increased by 1,411 AUMs to 19,189 AUMs in the short term due to existing forage that is not authorized. Long term available forage would be increased to 84,917 AUMs as a result of range developments and improving ecological condition. Appendix K lists the changes in available forage. Sixty miles of management fence would be constructed. Ten thousand forty acres of sagebrush would be controlled through prescribed burning, of which 2,420 acres would be seeded. Thirteen springs would be developed. A listing of the developments proposed for each allotment under Alternative B is included in Appendix L. Also, see Table 6.

Riparian
Riparian areas would be managed to achieve or maintain 60 percent of the vegetation potential on 1,280 acres within 20 years. Proposed riparian fencing would exclude 200 miles (816 acres) of additional riparian vegetation. Grazing systems would be used in the remaining areas to achieve desired objectives.

Forestry
Nearly all forestland suitable for timber production would be available for timber harvesting. An average annual sustainable harvest level would be approximately 1.45 MMBf from 10,964 acres of forestland (Table 7).

Exploration and Development of Mineral Resources
Public lands would remain open for the exploration and development of mineral resources and related rights of way (Table B). No surface occupancy stipulations would continue on public lands within the one half mile wide scenic waterways corridor in the Deschutes and John Day canyons. The remaining no surface occupancy restrictions now in place for oil and gas exploration and development would be removed. There would be approximately 60,000 acres on which no surface occupancy restrictions would apply (See Alternative A for description of NSO stipulation). Approximately 268,000 acres would be open to development with standard lease stipulations.

Land Tenure and Access

Exchange, Transfer or Sale
Public lands in Zones 1, 2 and 3 would be considered for transfer or exchange when lands with higher public value could be acquired. Public lands in Zones 2 and 3 with no apparent exchange opportunity would be considered for sale (up to 143,825 acres).

Agricultural Use of Public Lands
Agricultural use areas, except those in areas of high public value, would be sold (450 acres). Use in high public value areas (300 acres) and areas with agricultural potential not being used for agriculture could be authorized by permit or lease.

Public Access
Legal public access would be acquired into tracts of public land in Zones 1 and 2 for maximum public use.

Recreation
Public lands would be open to off road vehicle use, except in areas where significant damage to soil and vegetation is resulting from ORV use. Approximately 10,000 acres of public land would be limited or closed to ORV use.

Areas having collectible mineral resources, including plant and invertebrate fossils, would be available for rockhounding. Management and use of the areas would be recognized in land use decisions and would be reviewed on a case by case basis to ensure that no significant conflict exists with the protection of other natural values.

Special Management Areas

The Island In The Cove Palisades State Park

Same as Alternative A.

Deschutes and John Day River Canyons (Including the Red Wall)
Public lands would be managed consistent with the intent of the State Scenic Waterways Act. The Red Wall area would be designated as an ACEC (800 acres).

John Day River State Wildlife Refuge, Horn Butte Curlew Area, and White River Wildlife Areas

Habitat on public lands would be managed consistent with big game objectives recommended by the ODFW. Non game habitat would be provided where no significant conflicts occur with commodity production for economic values.

The Dalles Watershed
Same as Alternative A.

The Governor Tom McCall Preserve at Rowena and the botanical/scenic areas within the Columbia Gorge
Maintain and protect the unique qualities of these three areas.

Historic Spanish Gulch Mining District
Maintain and protect the unique qualities of this area.

The Oregon Trail Historic Sites at Fourmile Canyon and McDonald and the Macks Canyon Archaeological Site
The unique qualities of these three areas would be maintained and protected.

Alternative C (Continue Existing Management–No Action)

Wildlife
Existing habitat management plans would be continued.

Livestock Grazing Management
Initial and long term forage available for livestock would remain at 17,778 AUMs. Except for a few, minor developments proposed in existing Coordinated Resource Management Plans, and similar management agreements, there would be no new range developments. Grazing systems would continue which result in good management on 69,000 acres; maintenance management on 106,000; and unsatisfactory management on 116,000 acres. BLM would continue to work with operators and encourage improved grazing practices where needed.

Riparian
Fifty four miles of existing protection fence (67 miles or 270 acres of riparian vegetation) would be maintained. Eight hundred ninety two acres of riparian vegetation would continue to be grazed by livestock. One hundred seventy eight acres of riparian vegetation in unleased areas or island protected areas would not be grazed.

Forestry
Harvest levels of timber would be adjusted to accommodate other significant resource values. An average annual sustained harvest level would be approximately 1.43 MMBf per year (Table 7).

Exploration and Development of Mineral Resources
Same as Alternative A.

Land Tenure and Access

Exchange, Transfer or Sale
Public lands in Zones 2 and 3 on Map 3 would be considered for transfer or exchange. A limited number of tracts (up to 4,000 acres) in Zone 3 would be sold if consistent with the existing John Day River Management Framework Plan. Efforts to increase public land holdings or enhance public land values by exchange in Zone 1 would continue, especially in the Lower Deschutes and Lower John Day River areas.

Agricultural Use of Public Lands
Where significant conflicts with other resource values exist, agricultural use of public lands would be eliminated and those lands would be reclaimed. Conflicts with other resource values are thought to exist on 300 acres. Existing agricultural use would be authorized on approximately 100 acres. No additional agricultural permits or leases would be issued on the remaining lands (350 acres).

Public Access
Limited legal public access would be acquired into public lands in Zone 1.

Recreation
Off road vehicle use would be managed in the same manner as described in Alternative A.

Recreational mining (rockhounding) would be managed in the same manner as described in Alternative B.

Special Management Areas

The Island in The Cove Palisades State Park
The BLM would continue to cooperate with the Oregon State Parks and Recreation Division of the Department of Transportation to maintain natural qualities.

Deschutes and John Day River Canyons (Including the Red Wall)
The BLM would continue to cooperate with the State Parks and Recreation Division of the Oregon Department of Transportation to manage the public lands consistent with the intent of the State Scenic Waterways Act.

John Day River State Wildlife Refuge, Horn Butte Curlew Area and White River Wildlife Areas
The BLM would continue to cooperate with ODFW in providing habitat for game and non game species.

The Dalles Watershed
Same as Alternative A.

The Governor Tom McCall Preserve at Rowena and the botanical/scenic areas within the Columbia Gorge
Same as Alternative B.

Historic Spanish Gulch Mining District
Same as Alternative B.

The Oregon Trail Historic Sites at Fourmile Canyon and McDonald and the Macks Canyon Archaeological Site
Same as Alternative B.

Alternative D (Emphasize Natural Values While Accommodating Commodity Production)

Wildlife
Livestock grazing would be managed or excluded on approximately 15,000 acres of deer and elk winter range and 7,500 acres of curlew nesting habitat. Wildlife development projects would include eight spring developments, and 6,200 acres of sagebrush control through prescribed burning. Fish habitat improvements would occur on 150 miles of streams by means of log and rock placement, gabion development and treeltrub plantings.

Livestock Grazing Management
Forage available for livestock would be decreased by 5,469 AUMs to 12,309 AUMs in the short term and by 3944 AUMs to 13894 AUMs in the long term. This decrease would result from livestock exclusions from riparian areas, important wildlife habitat, and public lands in most of the lower Deschutes and John Day Canyons. This totals 82,268 acres in 47 allotments. To accomplish this, 330 miles of protection fence would be constructed. On the remainder of the land in the planning area, changes in period of use, exclusion or a combination of both, would occur where necessary to meet the objectives of this alternative. Intensive management which would encourage a change in ecological condition toward climax would be implemented on 177,000 acres. On the remaining 34,000 acres there would be less intensive management which would either improve or maintain existing conditions, as outlined in Table 6. Changes in available forage for each allotment are described in Appendix K.

Riparian
New riparian fencing would be constructed where multiple use benefits exceed cost of construction and maintenance. For purposes of analysis, it is assumed that an additional 275 miles (1,070 acres) of riparian vegetation would be excluded. Grazing systems would be designed to achieve or maintain 60 percent of the vegetative potential in the remaining riparian areas.

Forestry
An average annual sustainable harvest level would be approximately 1.42 MMbf (Table 7). Land use allocations would be made to protect wildlife and fish habitat, water quality, riparian vegetation, and visual qualities.

Exploration and Development of Mineral Resources
Exploration and development of mineral resources would be allowed where no significant conflicts with wildlife, riparian, or recreation values exist (Table 8). Approximately 172,000 acres would remain open to development with the standard lease stipulations. Where conflicts exist, leasing would be allowed where extraction of the mineral resource was considered feasible under a "no surface occupancy" stipulation. If extraction of the mineral resource was not considered feasible under these conditions, the area would not be leased for oil and gas exploration and development. (See Alternative A for description of NSO stipulation).

Land Tenure and Access

Exchange, Transfer or Sale
Public land in Zone 3 on Map 3 would be sold if no apparent exchange opportunity existed (up to 29,616 acres). Public land in Zones 1 and 2 would be exchanged to enhance wildlife, riparian, watershed, recreation, visual and other natural values in Zone 1.

Agricultural Use of Public Lands
Agricultural use of public lands in riparian areas, crucial or important wildlife habitats, or other public lands (300 acres) in Zone 1 would not be permitted. These areas would be retained. Agricultural use of the remaining public lands (450 acres) would be authorized by permit in Zone 2, or sold if located in Zone 3, provided no significant resource values exist on these lands.

Public Access
Legal public access to large tracts of public land in Zone 1 would be acquired if public use would not significantly conflict with riparian, wildlife, watershed, and other natural values, including primitive recreation opportunities.

Recreation
Public lands would be limited or closed to off road vehicle use where significant damage to soils, vegetation, wildlife, primitive recreation or visual qualities is occurring or would occur. Limited or closed designations would be placed on approximately 150,000 acres of public land. Vehicle use would be confined to existing or designated roads and trails in these areas.
Recreational mining (rockhounding) would be managed in the same manner as described in Alternative A.

Special Management Areas

The Island in The Cove Palisades State Park
Same as Alternative A.

Deschutes and John Day River Canyons (Including the Red Wall)
Public lands within the scenic waterway boundaries of the Deschutes and John Day rivers would be designated as ACECs.

John Day River State Wildlife Refuge, Horn Butte Curlew Area and White River Wildlife Areas
Incompatible uses would be excluded from these areas. Forage and habitat needs would be met for game and nongame species, as recommended by ODFW.

The Dalles Watershed
Same as Alternative A.

The Governor Tom McCall Preserve at Rowena and the botanical/scenic areas within the Columbia Gorge
Same as Alternative B, and in addition, exclude incompatible uses.

Historic Spanish Gulch Mining District
Same as Alternative B, and in addition, exclude incompatible uses.

The Oregon Trail Historic Sites at Fourmile Canyon and McDonald and the Macks Canyon Archaeological Site
Same as Alternative B, and in addition, exclude incompatible uses.

Alternative E (Emphasize Natural Values)

Wildlife
All forage would be available for wildlife. Fish and wildlife habitat improvement projects would be the same as Alternative D.

Livestock Grazing Management
Initial and long term forage available for livestock would be reduced to 0 AUMs. One thousand six hundred fifteen miles of fence would be constructed to exclude livestock. No livestock grazing would be allowed on public lands.

Riparian
A good or excellent channel stability rating would be achieved in all riparian areas. With total exclusion of livestock grazing on all public lands in the planning area no additional riparian protection fence would be required.

Forestry
An average annual harvest level would be approximately 0.2 MMbf and would only occur in areas where no conflicts exist with other resource values, or where timber harvesting would be designed to benefit other resource values (Table 7).

Exploration and Development of Mineral Resources
Exploration and development of mineral resources would be allowed where no significant conflicts exist with wildlife, riparian, recreation or visual resources (Table 8). Approximately 121,000 acres would remain open to development with standard lease stipulations. Those areas where significant conflicts exist would be leased if the mineral resource was considered feasible to extract under a "no surface occupancy" stipulation. If extraction of the mineral resource was not considered feasible under these conditions, the area would not be leased for oil and gas exploration and development. There are approximately 230,000 acres where conflicts could exist. (See Alternative A for description of NSO stipulation)

Land Tenure and Access

Exchange, Transfer or Sale
No public lands would be sold. Exchanges in Zones 1, 2 and 3 on Map 3 would occur if wildlife, riparian, watershed, scenic and other natural values—including primitive recreation opportunities—were enhanced in Zone 1 or 2.

Agricultural Use of Public Lands
No agricultural permits or leases would be issued. Agricultural use on all 750 acres would be reclaimed.

Public Access
No additional legal public access would be acquired to public lands.

Recreation
Public lands would be closed to off road vehicle use where significant resource damage is occurring or would occur. Off road vehicle limitations or closures would also be implemented where significant conflicts exist with other uses of public lands. This would apply to approximately 200,000 acres of public land. Vehicle use would be confined to existing or designated roads in these areas.
Areas having high quality collectible mineral resources, including plant and invertebrate fossils, would be available for rockhounding. Management and use of these areas would be recognized in land use decisions and would be reviewed on a case by case basis to ensure that no significant conflict exists with the protection of other natural values.

Special Management Areas

The Island in the Cove Palisades State Park
Eighty acres of USFS land would be acquired and the entire area would be designated as a Research Natural Area under BLM jurisdiction (250 acres).

Deschutes and John Day River Canyons (Including the Red Wall)
Public lands within the Deschutes and John Day river canyons would be designated as ACECs.

John Day River State Wildlife Refuge, Horn Butte Curlew Area and White River Wildlife Areas
Same as Alternative D

The Dalles Watershed
Same as Alternative A.

The Governor Tom McCall Preserve at Rowena and the botanical/scenic areas within the Columbia Gorge
Same as Alternative A. Public lands within these areas would also be designated as ACECs if they meet criteria necessary to warrant designation.

Historic Spanish Gulch Mining District
Same as Alternative A.

The Oregon Trail Historic Sites at Fourmile Canyon and McDonald and the Macks Canyon Archaeological Site

The unusual qualities of these sites would be maintained and protected. Management plans, as well as public information and interpretive plans for these areas would also be developed. Public lands within these areas would also be designated as Areas of Critical Environmental Concern (ACEC), if they meet criteria necessary to warrant designation.

Table 6 Grazing Systems by Alternative and Management Category

	Existing Situation	Alternatives A (Preferred)	B (Commodity Production)	C (Existing Management)	D (Natural Values w/ Commodities)	E (Natural Values)
Category System [1]	No. Allot./ Acres	No. Allot./ Acres	No. Allot./ Acres	No. Allot./ Acres	No. Allot./ Acres	No. Allot./ Acres
Improve						
1	12/50,178	59/183,692	59/183,692	12/50,178	21/105,742	
2	22/63,243			22/63,243		
3	25/70,271			25/70,271		
4					38/77,950	59/183,692
Maintain						
1	12/15,560	32/47,284	32/47,284	12/15,560	26/44,478	
2	14/17,514	9/5,250	9/5,250	14/17,514	9/5,250	
3	15/19,460			15/19,460		
4					6/2,806	41/52,534
Custodial						
1	12/3,568	66/28,043	66/28,043	12/3,568	63/26,591	
2	57/25,078	67/28,467	67/28,467	57/25,078	67/28,467	
3	64/27,864			64/27,864		
4					3/1,452	133/56,510
TOTAL						
1	36/69,306	157/259,019	157/259,019	36/69,306	110/176,811	
2	93/105,835	76/33,717	76/33,717	93/105,835	76/33,717	
3	104/117,959			104/117,595		
4					47/82,208	233/292,736
TOTALS	233/292,736	233/292,736	233/292,736	233/292,736	233/292,736	233/292,736

[1]
1 Systems which will encourage an upward change in ecological condition (early spring, deferred, deferred rotation, winter, rest rotation).
2 Systems which will maintain or improve existing ecological conditions (deferred use one of three years).
3 Systems which will encourage a downward change in ecological condition (spring/summer).
4 Exclusion.

Table 7–Forestry Practices by Alternative (Each Decade)

	Alternative A (Preferred)	B (Commodity Production)	C (Existing Management)	D (Natural Values w/ Commodities)	E (Natural Values)
Intensive Timber Production Base (acres)	10,715	10,984	10,833	10,745	0
Harvest Level [1] Yearly Average (MMbf)	1.41	1.45	1.43	1.42	.2
Treatments [2] Transportation System (miles/acres)					
New Construction	6/17	6/17	6/17	6/17	1/3
Improvement	7/15	7/15	7/15	7/15	1/2
Timber Harvest (acres)					
Clearcut	65	67	66	65	9
Partial Cut	2261	2324	2297	2268	321
Timber Harvesting Method (acres)					
Cable	85	87	86	85	12
Tractor	2242	2304	2267	2249	318
Slash Disposal (acres)					
Broadcast Burn	65	65	66	65	9
Pile and Burn	1658	1704	1677	1663	235
Lop and Scatter	365	375	369	366	52

[1]For purposes of analysis, volume calculations are based on the current annual sustainable harvest level of 132 board feet per acre. This figure may change when an extensive forest inventory is completed in 1985, and the sustainable harvest level is recalculated.

[2]Figures are estimates based on a five year timber sale plan and were made to facilitate impact analysis. Although acreages may vary with implementation, the relationship among alternatives is expected to remain constant.

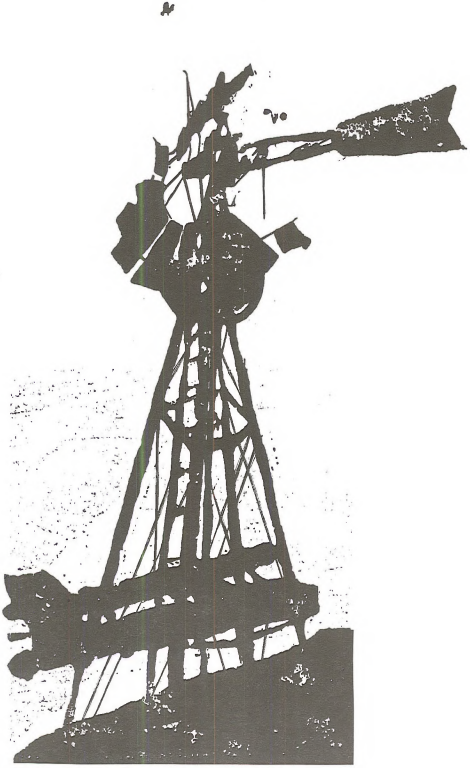
Table 8 Comparative Leasing Options

	Alt. A (Preferred)		Alt. B (Commodity Production)		Alt. C (Existing Management)		Alt. D (Natural Values w/Commodities)		Alt. E (Natural Values)	
	Acres (000)	% Public Mineral Acreage	Acres (000)	% Public Mineral Acreage	Acres (000)	% Public Mineral Acreage	Acres (000)	% Public Mineral Acreage	Acres (000)	% Public Mineral Acreage
Public Land Open to Development with Standard Stipulations	190	26.9%	262	37.1%	190	26.9%	172	24.4%	122	17.2%
Open to Development with Restrictive Stipulations[1]	132	18.6%	60	8.4%	132	18.6%	150	21.1%	200	28.3%
Closed to Leasing	3	.4%	3	.4%	3	.4%	3	.4%	3	.4%
Reserved Federal Mineral Estate Open to Leasing With Standard Stipulations	383	54.1%	383	54.1%	383	54.1%	383	54.1%	383	54.1%
Totals	708	100%	708	100%	708	100%	708	100%	708	100%

[1]Restrictive Stipulations--refers to no surface occupancy stipulations, which reads: "Because of the high scenic and recreational values, no surface occupancy is allowed on the part of the lease falling within the John Day River canyon or the Deschutes River canyon, unless written permission is granted by the BLM deputy state director for minerals with the consent of the Prineville BLM District Manager."

(Restrictions or changes in lease stipulations proposed under any of the alternatives would apply only to areas not presently leased or areas presently leased where leases are renewed.)

Chapter 3 Affected Environment



Old windmill in Ferry Canyon

Introduction

This chapter describes public lands as they now exist within the Two Rivers Planning Area. Emphasis has been placed on resources that would be affected by alternatives analyzed in this RMP/EIS.

The information in this chapter is summarized from the Management Situation Analysis (MSA) and other resource inventories on file at the Prineville District office. These documents are available for public examination during normal working hours.

Soil

Many soil surveys have been compiled in the planning area, primarily by the Soil Conservation Service in connection with agriculture (croplands) in the various counties. The most recent survey was an unpublished BLM survey conducted in 1980/81 on approximately 313,000 acres of public lands and 117,000 acres of private lands.

Generalized soil associations are described on Map 4. Table 9 summarizes soil characteristics and soil erosion hazard potentials within the planning area.

Water

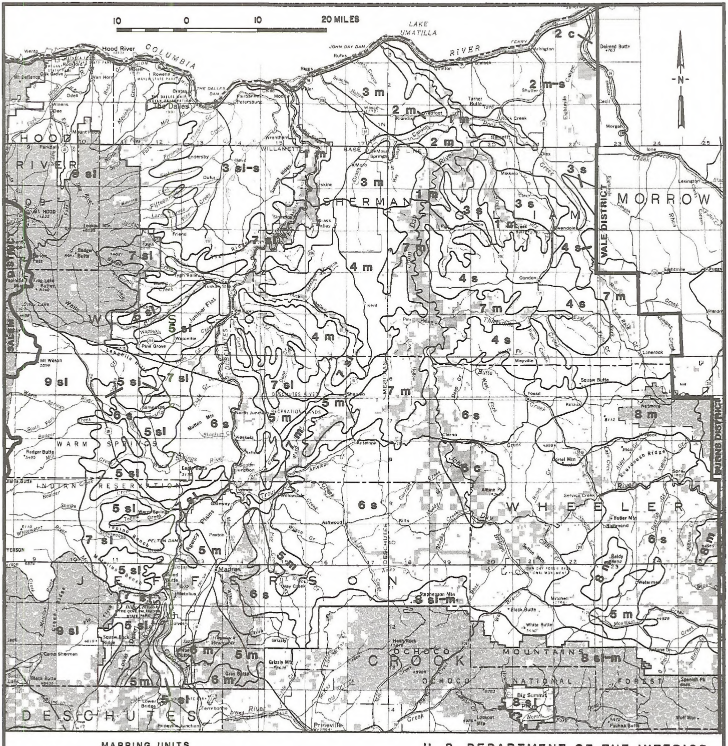
The planning area is drained primarily by the Deschutes and John Day rivers. The John Day River is subject to extreme fluctuations in flow. Peak flows generally occur from February to June. The 1964 flood was the extreme of record at 40,200 cubic feet per second (cfs) at Service Creek. The average discharge is 2,833 cfs and the minimum flow has been recorded as low as 6.0 cfs. The John Day system also has a history of brief but intense convection storms (thunderstorms) mainly in May through September. The storms are generally localized and affect the main river and its major tributaries. Water quality and stream characteristics of both the John Day and Deschutes river basins is addressed in more detail in the riparian management section and in Appendices M and N.

The Deschutes River generally fluctuates less because of dams that help control peak runoff, and along with spring fed streams, provide for a higher and more stabilized minimum flow. Generally, the

Table 9 Soil Characteristics Summary

Soils Unit	Soil Association[1]	Topography	Depth	Textures	Avg. Slope	Erosion Hazard [2] Water	Wind
1	Nansene–Starbuck Lickskillet	Ravines, Canyons	Shallow to deep	Silt loam, very stony loams	10 – 70%	Mod – severe	Slight
2	Ritzville-Mikkalo	Plateau	Mod deep to deep	Silt loams	0 – 15%	Mod – severe	Severe
3	Walla Walla–Lickskillet	Plateau	Shallow to deep	Silt loam, very stony loams	0 – 15%	Slight – severe	Slight – Severe
4	Condon–Morrow–Lickskillet	Rolling plateau	Shallow to mod deep	Silt loams, very stony loam	5 – 30%	Moderate – severe	Moderate
5	Bakeoven–Condon–Madras	Level to Rolling Basalt Plateaus	Shallow to mod deep	Silt loam, very cobbly loam, clay loam, very stony loam	5 – 15%	Slight–moderate	Slight – Moderate
6	Simas–Gwin–Tub	Steep bissected uplands, canyons	Shallow to deep	Clay, gravelly, very cobbly silty clay loam	10 – 70%	Moderate–critical	Slight
7	Lickskillet–Wrentham Simas	Ravine, canyons	Shallow to deep	Very stony loam, gravelly silt, loam clay	10 – 70%	Moderate–severe	Slight
8	McGarr–Hankins–Broadtree	Steep upland, mountains	Mod deep to deep	Clay loam, clay gravelly loam	5 – 70%	Slight–	Slight
9	Wamic-Ketchly-Fralley	Mountains	Deep	Loam	5 – 80%	Slight-moderate	Slight

[1]Soil associations are very generalized and therefore the characteristics are generalized.
[2]Erosion hazard potentials are rated as follows:
Slight–less than 2.5 ton/acre/year
Moderate–2.5 to 10 ton/acre/year
Severe–5 to 15 ton/acre/year
Critical–over 15 ton/acre/year



MAPPING UNITS

1 Nansene-Starbuck-Lickskillet Association
2 Ritzville-Mikkalo Association
3 Walla Walla-Lickskillet-Condon Association
4 Condon-Morrow-Lickskillet Association
5 Bakeoven-Condon-Madras Association
6 Simas-Gwin-Tub Association
7 Lickskillet-Wrentham-Simas Association
8 McGarr-Hankins-Broadtree Association
9 Wamic-Ketchly-Frailey Association

The symbol behind each soil number indicates over all erosion potential due to water or wind.

sl slight erosion (less than 2.5 tons/acre/year)
m moderate erosion (2.5-10 tons/acre/year)
s severe erosion (5-15 tons/acre/year)
c critical erosion (over 15 tons/acre/year)

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MAP 4
General Soils

peak flows come from April through June. The extreme flow of record, however, occurred on December 23, 1964, at 75,500 cfs recorded at Moody (Biggs), Oregon. The Deschutes River averages 5,813 cfs. The minimum recorded since dam construction was 2,400 cfs, also at Moody.

The ground water system is dominated geologically by the Columbia River basalts, resulting in highly variable aquifers. Generally, flows are toward either the Deschutes or the John Day river canyons. There are also shallow alluvial aquifers along all tributaries and canyons that support springs, seeps and recharge of intermittent and perennial streams.

Climate

Climate for most of the planning area is generally semiarid. It is characterized by long, cool, moist winters and short, warm, dry summers. The length and character of climatic summer and winter extremes are influenced by elevation, aspect, the rain shadow effect of the Cascade Mountains, and the wind tunnel effect of the Columbia River Gorge.

Air quality is excellent in the planning area, with visibility on most days ranging from 60 to 80 miles or more. That quality is impacted occasionally by burning conducted through agricultural and forest management practices.

Vegetation

Vegetation Types

The existing plant communities in the planning area have been classified into 14 vegetation types based on an ecological site inventory conducted in 1980 and 1981.

Table 10 summarizes the acreage by vegetation type. Appendix O describes the methodology used to determine the vegetative site classification.

The planning area generally falls within the Columbia Basin physiographic province, but includes some of the Blue Mountain physiographic province. Within the Columbia Basin the vegetation is predominately big sagebrush/bunchgrass and bunchgrass, with some communities dominated by rabbitbrush or snakeweed. The rolling hills and plateaus above the drainages are usually dominated by big sagebrush on deeper soils, with low and/or stiff sagebrush on shallower soils. Bunchgrass dominant communities are also found on some of the plateaus and on most of the steep slopes of the river canyons.

Coniferous forest representative of the Blue Mountain physiographic province is found mainly along the southern and eastern boundaries of the planning area and in the Big Summit Prairie area. Along the western boundary, the ponderosa shrub forest is part of the Columbia Basin. White oak is found in the White River/The Dalles area. Juniper dominated communities occur mostly in the southern part of the planning area.

Riparian areas make up less than 1 percent of the public lands in the planning area. These areas contribute to biological diversity, streambank and channel stability, and water quality, yet are often the most heavily utilized. Recreation, livestock, agriculture/irrigation, and wildlife all contribute to the total use of these fragile areas.

Ecological Condition

Ecological condition, based on the relationship between existing plant composition on a given site and the composition of that site in a pristine state, is shown in Table 11. Appendix E shows ecological condition by allotment. An ecological site inventory (The Oregon Automated Ecological Site Information System described in Appendix O) was used to determine ecological condition. Existing vegetation is defined in one of four classes as climax, late seral, mid seral, or early seral condition (see Glossary). These classes generally relate to excellent, good, fair, and poor range condition.

The category unclassified/other relates to land where no condition could be determined, such as rockland, river wash, etc. It also includes seeded acreage, abandoned or unauthorized fields, and other unnaturally vegetated acreage. Land not inventoried is also included.

Because of its importance to other resources, riparian vegetation was intensively inventoried. All vegetation not riparian is considered to be upland vegetation.

Tables 12 and 13 summarize ecological condition and trend of riparian vegetation in the planning area.

Plant Diversity

Plant diversity is expressed as the number of different plant species found within a vegetation type. For each of the 14 vegetation types, plant diversity varies in relation to ecological condition. For example, greater species diversity exists in a juniper big sagebrush vegetation type when in late seral ecological condition than in either early seral or climax conditions. Plants found in late seral to climax conditions may not be present in early seral condition and plants commonly found in early seral sites may not be evident in climax condition. That is

Table 10 Vegetation Types

Vegetation Type	Acres	Percent of Planning Area	Primary Associated Plant Species
Juniper big sagebrush	13,840	4	At least 10 percent with Wyoming big sagebrush, basin big sagebrush, mountain big sagebrush, rabbitbrush, snakeweed, bluebunch wheatgrass, needle and thread grass, Thurber's needlegrass, Idaho fescue, squirreltail, junegrass, Kentucky bluegrass, basin wild ryegrass, Sandberg bluegrass, cheatgrass, phlox, aster.
Juniper low sagebrush	3,485	1	At least 10 percent juniper with low sagebrush, stiff sagebrush, and grasses and forbs.
Juniper bitterbrush	893	Less than 1	At least 10 percent juniper with bitterbrush, Idaho fescue, mountain sagebrush, Thurber's needlegrass, squirrel tail, mountain brome.
Juniper bunchgrass	21,721	7	Mature juniper, bluebunch wheatgrass, Idaho fescue, needlegrasses, bluegrasses.
Big Sagebrush	73,365	23	Similar to juniper big sagebrush without juniper.
Low sagebrush bunchgrass	28,970	9	Stiff sagebrush, low sagebrush, Sandberg bluegrass, bluebunch wheatgrass, Idaho fescue, Thurber's needlegrass, biscuitroot, buckwheat, cheatgrass.
Other brush dominant	48,157	15	Antelope bitterbrush, rabbitbrush, snakeweed, buckwheat, Idaho fescue, sagebrush, Sandberg bluegrass, cheatgrass, bluebunch wheatgrass, giant wildrye, fleabane.
Ponderosa Pine	4,305	1	Ponderosa pine, snowberry, juniper, sagebrush, bitterbrush, bluebunch wheatgrass, Idaho fescue, sedge, pinegrass, mountain brome, Sandberg bluegrass.
Mixed conifer	9,149	3	Douglas fir, white fir, ponderosa pine, mountain brome, bluegrass, pinegrass, western fescue, bracken fern, elk sedge, snowberry, forbs.
Mahogany dominant	649	Less than 1	Curleaf mountain mahogany, sagebrush, bluegrass, fescue, bluebunch wheatgrass, forbs.
White oak dominant	3,200	1	White oak, bitterbrush, rabbitbrush, bluebunch wheatgrass, western fescue, Idaho fescue, Sandberg bluegrass, forbs.
Crested wheatgrass	350	Less than 1	Crested wheatgrass, nomad alfalfa, intermediate wheatgrass, sagebrush, rabbitbrush, juniper, bunchgrass, forbs.
Bunchgrass	106,179	32	Wheatgrass, needlegrass, fescue, ryegrass, forbs, sagebrush, snakeweed, rabbitbrush, bitterbrush, juniper.
Riparian	1,280	Less than 1	Perennial grasses, sedges, rushes, cattails, shrubs, deciduous trees, emergent water plants.
Unclassified, Unmapped	9,162	3	

Table 11--Present Ecological Condition

Ecological Condition Class	Public Land Acres	Percent of RMP/EIS Area
All Vegetation Types		
Climax (excellent)	25,344	8
Late seral (good)	106,809	33
Mid-seral (fair)	95,500	29
Early seral (poor)	87,540	27
Unclassified/Other 1/	9,512	3
Total 2/	324,705	100

1/Other: Vegetation no longer in "natural" condition. For example, abandoned farmland or seedings. Rockland, river wash and sand dunes are also included.

2/Total includes riparian areas.

Table 12
Summary of Ecological Condition of Riparian Vegetation (Acres Public Land)[1]

	Climax (Excellent)	Late Seral (Good)	Mid Seral (Fair)	Early Seral (Poor)	Total
Deschutes Basin	207	174	116	92	589
John Day Basin	16	22	21	632	691
Total	223	196	137	724	1,280

Table 13
Summary of Ecological Trend of Riparian Vegetation (Acres Public Land)

	Improving	Stable	Declining	Total
Deschutes Basin	200	375	14	589
John Day Basin	64	623	4	691
Total	264	998	18	1,280

1/Riparian Inventory
In summer 1980 and 1981 BLM personnel collected data from public stream riparian areas in the Two Rivers Planning Area.

Some of the data included: miles of stream, acres of riparian habitat, plant utilization, species composition (particularly trees and shrubs), type of plant community, understory vegetation, percent cover, slope, height categories of trees and wildlife observations. A narrative for each stream segment describes livestock and wildlife impacts, stream channel damage, recreational use, plant reproduction, apparent habitat trend and management recommendations. Photographs were taken of the representative plant community found within each stream system.

In summer 1981 the riparian and aquatic habitats of the Deschutes and John Day rivers were inventoried by low level color infrared photography. Ground truthing plots were established before the aerial photography. Photo interpretation completed this unique inventory method.

Rating System

The condition of the riparian habitat for wildlife was rated as excellent, good, fair or poor. As with any rating system, the selection of condition classes is subjective and reflects the biologist's professional opinion. Habitat potential was an important factor in rating condition. Sparsely vegetated areas which once supported dense growth of trees, shrubs and grasses would be rated poor or fair. Inventory data is on file in the Prineville District office.

because both early seral and climax vegetation tends to be more homogeneous and thus has fewer plant species.

The greatest diversity of plant species is found in the lower half of late seral and upper half of mid seral condition vegetation, except for riparian and white oak vegetation types where the greatest diversity is found in late seral and climax condition classes. Based on this criteria, plant diversity is high on 95,705 acres, or about 29 percent of the public land in the planning area. On 220,000 acres or 68 percent, the diversity is low and on the remaining 9,000 acres, or 3 percent, the diversity has not been determined.

Threatened, Endangered, or Sensitive Plant Species

On public lands there are 31 vascular plant species known to occur, or suspected of occurring, that are listed as endangered, threatened or sensitive in Oregon, by the Oregon Natural Heritage Data Base. These are listed on Table 14. Of these, 13 species are candidates for Federal listing (1980 Federal Register, Notice of Review and 1983 supplements).

Wildlife

Upland Habitat Diversity

Habitat diversity is the variety of land forms, vegetation, vegetation types, and water in any given habitat type. For example, sagebrush adjacent to seeded grass increases habitat diversity around the perimeter of the seeding (edge effect). A variety of plant species also increases habitat diversity. A variety in structure (physical aspects of vegetation) increases habitat diversity. Specific examples would be clumps of high grass in a grazed meadow, several age classes of aspen along a stream, and snags or dead trees in a stand of timber. The diversity of wildlife species is directly related to vegetative diversity and both are an integral part of habitat stability. The diversity of vegetation in any given habitat depends on its ecological condition class.

Habitat diversity can be correlated with ecological condition described in the vegetation section. Mid or late seral ecological condition has greater habitat diversity than early seral or climax condition. Seedings have low habitat diversity.

Wildlife habitat was considered as the prime determinant of wildlife welfare and, since wildlife usually respond to vegetative structure rather than composition, structurally similar plant communities

Table 14 Threatened, Endangered or Sensitive Plant Species

Plant Name	State Status[1]	Federal Status[2]
Allium campanulatum	2	-
Allium madidum	3	-
Allium pleianthum*	3	-
Allium robinsonii	2	-
Arabis furcata	3	-
Arabis sparsiflora var. atrorubens	2	-
Arenaria franklinii var. thompsonii	1	c
Astragalus collinus var. laurentii	1	c
Astragalus diaphanus*	1	c
Astragalus hoodianus	3	-
Astragalus howellii var. howellii	3	-
Astragalus tyghensis*	1	c
Botrychium lunaria	2	-
Botrychium virginianum	2	-
Castilleja xanthotricha*	3	c
Chaenactis nevii*	3	-
Collomia macrocalyx*	3	c
Lomatium farinosum var. hambleniae	2	-
Lomatium salmoniflorum	2	-
Lomatium watsonii	2	-
Lupinus biddlei	1	c
Lupinus sericeus var. egglestonianus	2	-
Mimulus jungermanniodes*	3	-
Myosurus minimus ssp. apus var. sessiliflorus	1	c
Penstemon barrettiae	1	c
Penstemon eriantherus var. argillosus*	3	-
Penstemon peckii	3	c
Ranunculus reconditus	1	c
Silene scaposa var. scaposa*	1	c
Suksdorfia violaceae	1	-
Thelypodium eucosmum*	1	c

[1]From Rare, Threatened and Endangered Plants and Animals of Oregon, Oregon Natural Heritage Data Base, July 1983, as amended at the ONHDB sponsored conference, November 1984.

1--Endangered or Threatened throughout range
2--Endangered or Threatened in Oregon
3--Limited in abundance but currently stable

[2]From 1980 Federal Register-Notice of Review and 1983 Supplements

c Federal candidate threatened or endangered
- No federal status

*Recent occurrence documented on public land within planning area.

were grouped into distinct and important habitat types as described in the vegetation section in Table 10.

Old growth timber is considered a unique and important habitat type, although only small scattered stands remain on public land in the planning area. Nearly all of the forestland in the planning area has been cut over.

There are 356 different wildlife species within the planning area. Evaluation of the effects of management practices on the total population of each species is very difficult. However, the life form concept, the grouping of animals based on specific requirements for feeding and reproduction, allows a grouping of all wildlife species found in the planning area into one or more of the 16 life form groups which are sumarized in Appendix P.

Big game, threatened or endangered species, upland birds, and waterfowl are discussed in detail because of their economic importance, legal status or sensitive position in the planning area. Table 15 lists the numbers of wildlife species dependent on each habitat type. Table 16 shows acres of crucial and important wildlife habitats in the planning area.

Big Game Habitat

Mule Deer and Black Tail Deer

Mule deer are found throughout the planning area with most of the public land use occurring on crucial winter range (10,200 acres) and canyon drainages for summer cover. Winter and summer cover is provided by western juniper, riparian shrubs, and rough topography. Wintering mule deer populations on public lands are slightly below management objective numbers established by the ODFW in seven game management units and at or above management objective numbers in two units.

Black tail deer are found primarily in the White River Game Management Area along the eastern boundary of the Mt. Hood National Forest during the winter months. Map 5 shows the extent of deer winter range and other wildlife habitats. Wintering black tail deer numbers are currently below ODFW's management objective on public land.

Rocky Mountain and Roosevelt Elk

Rocky Mountain elk populations on public lands are located primarily along the northern boundary of the Ochoco National Forest and the eastern boundary of the Mt. Hood National Forest (Map 5). Elk are found scattered along the western boundary of the Umatilla National Forest. The ODFW has not

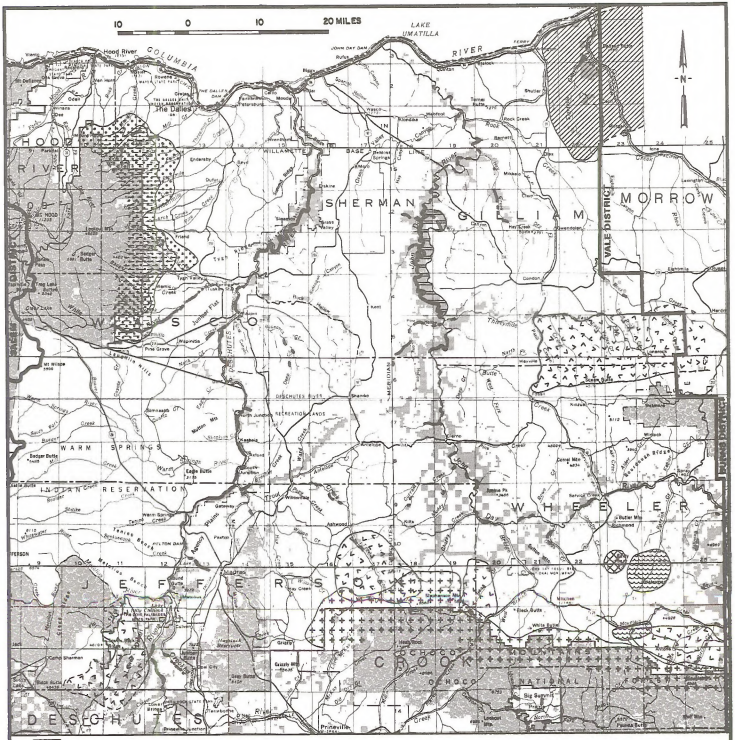
Table 15--Wildlife Habitat and Species Use

Habitat Type	Public Acres	Number of Wildlife Species Using Habitats[1] Primary Use[2] Reproduction	Primary Use[2] Feeding	Secondary Use[3] Reproduction	Secondary Use[3] Feeding
Juniper big sagebrush	13,840	74	87	31	57
Juniper low sagebrush	3,485	9	10	52	87
Juniper bitterbrush	893	40	45	51	69
Juniper bunchgrass	21,721	36	44	27	48
Big sagebrush bunchgrass	73,365	74	86	19	36
Low sagebrush bunchgrass	28,970	20	24	18	50
Other brush dominant	48,157	41	45	31	67
Ponderosa pine	4,305	74	84	37	63
Mixed conifer	9,149	89	90	37	42
Mahogany dominant	649	4	5	17	47
Crested wheatgrass	350	0	2	11	40
Bunchgrass	106,179	44	61	24	59
Riparian[4]	1,280	229	282	16	30
White Oak	3,200	72	88	28	49
Unclassified, unmapped	9,162				

[1]Species may use more than one habitat
[2]Habitat used 40 percent of time or more
[3]Habitat used less than 40 percent of time
[4]Includes river and stream riparian areas

Table 16--Crucial and Important Wildlife Habitats

Species	Habitat Type	Public Land Acres
Mule Deer	Crucial Winter Range	10,200
Blacktail Deer	Winter Range	1,840
Rocky Mountain Elk	Year Long Range	560
	Winter Range	3,240
Roosevelt Elk	Winter Range	1,300
Pronghorn Antelope	Year Long Range	800
California Bighorn Sheep	Potential Range	14,000
Long Billed Curlew	Crucial Nesting Habitat	7,500
Wild Turkey	Year Long Range	1,360
Waterfowl	Nesting and Rearing Habitat	1,280
Raptors	Nesting Habitat	Rims and Ledges of Major Canyons



- Crucial Mule Deer Winter Range
- Rocky Mtn. Elk Winter Range
- Rocky Mtn. Elk Yearlong Range
- Antelope Yearlong Range
- Potential California Bighorn Sheep Range
- Blacktail Deer/Rocky Mtn. Elk/Roosevelt Elk
- Long Billed Curlew Nesting Habitat
- Wild Turkey Habitat
- Riparian Areas on Public Land

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MAP 5
Riparian Areas and Wildlife Habitat

identified any crucial elk winter range, although 3,240 acres of winter habitat are in the planning area. Two of three game units having Rocky Mountain elk exceeded ODFW management objective numbers for wintering animals on public land.

Roosevelt elk on public lands are found along the eastern boundary of the Mt. Hood National Forest. Approximately 1,300 acres of winter habitat are within the White River Game Management Area. ODFW management objective numbers for this game unit have been exceeded for wintering Roosevelt elk on public land.

Antelope

Antelope populations are limited in the planning area. Year round range of 800 acres of public land is located east of Mitchell in the Waterman Flat and Antone areas (Map 5). Antelope are reestablishing in scattered numbers in the Shaniko area and along the Columbia River. Some antelope are found in the summer on public land scattered around Big Summit Prairie. Sagebrush and grassland/forb habitats are dominant vegetation on antelope range. A major factor for the limited or scattered numbers of antelope has been the habitat conversion to cultivated fields, reducing available habitat.

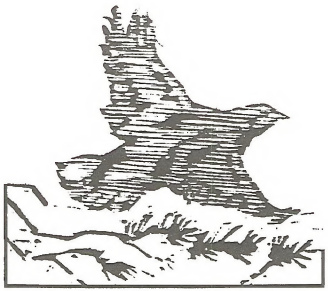
California Bighorn Sheep

The proposed reestablishment of bighorn sheep in the Lower John Day River canyon area has been a continuing topic with the Bureau of Land Management and the Oregon Department of Fish and Wildlife. The proposal remains in preliminary stages. Approximately 14,000 acres of public lands have been identified as potential area for reestablishment of the sheep (Map 5).

Other Wildlife

Upland birds, waterfowl, and other wildlife species found in the planning area are listed in Appendix P.

Upland birds found in the planning area include chukar partridge, California valley quail, pheasant, mountain quail, blue grouse, ruffed grouse, and Gray partridge. Limited numbers of sage grouse and wild turkey are found in the area (Map 5). The most prevalent upland bird in the planning area and most popular for hunting is the chukar. The Deschutes and John Day canyons are capable of supporting large populations and have good habitat for these birds. California valley quail are closely associated with riparian areas. Blue grouse, ruffed grouse, and mountain quail are found in the conifer vegetation types. Pheasant and Gray partridge can be found on public lands adjacent to cultivated



Chukar

fields. Limited numbers of sage grouse are found in low sage bunchgrass habitat types. Wild turkeys are found primarily in the oak grass and mixed conifer and pine habitat types of the eastern boundary of the Mt. Hood National Forest.

Waterfowl in the planning area during migration and nesting seasons include five species of geese and 23 species of ducks (Appendix P). The more popular species include the mallard, pintail, widgeon, teal, merganser, and Canada goose. The Deschutes and John Day rivers support most of the waterfowl that occur in the planning area.

The long billed curlew has become a species of concern because of a decline in available nesting habitat caused by increased agricultural field development in the past decade along the Columbia River. There are approximately 7,500 acres of public land identified as primary nesting habitat or potential habitat (Map 5). Part of this area (4,300 acres) is a potential ACEC.

Threatened or Endangered Species

There is one wildlife species (the bald eagle) in the planning area that is included on the Secretary of the Interior's list of endangered and threatened wildlife (50 CFR 17.11 and 17.12, 1984).

The bald eagle is classified as threatened in Oregon and is a winter migrant to the area. Areas

of use include the Deschutes River, John Day River, White River, Columbia River, and some areas adjacent to these drainages.

Riparian Habitat

The riparian habitat provides a very important source of food and cover for all species. Trees and shrubs provide summer shade and winter forage and grasses provide season long green forage. When riparian areas are in the higher ecological condition classes, plant diversity is high, allowing increased wildlife diversity.

Streamside riparian habitat inventoried in the area consists of 1,280 acres along 247 stream miles on public land. Map 5 shows the location of known riparian habitat on public lands in the planning area. These riparian areas are used during all seasons of the year by nearly 90 percent of the 356 wildlife species in the area (Appendix P).

Wildlife riparian habitat condition is directly related to ecological condition. Plant diversity in riparian areas increases with an increase in ecological condition. Wildlife species diversity increases with a higher ecological condition. As ecological condition increases, the total area of riparian habitat also increases. Besides allowing for an increase in wildlife species using the habitat, it also provides for more habitat for individuals within each species.

Present riparian habitat management in the planning area consists of fencing, unleased areas (not grazed by livestock), and areas excluded from grazing by natural or physical barriers (islands on the Deschutes River protected by a stabilized high flow and springs on inaccessible cliffs). Riparian habitat under present protection totals approximately 67 miles through fencing (210 acres).

Fish Habitat

Fish habitat condition and trend vary considerably between the Deschutes River basin and the John Day River basin. Historically, the Deschutes and John Day basins were major spawning grounds for anadromous fish species. Habitat degradation and other factors have significantly reduced the production of these systems.

There are approximately 247 miles of inventoried stream on public lands that have fish or the potential to support fish (Appendix N). There are 215 miles of stream that contain fish populations of which 187 miles support anadromous fish species (steelhead, chinook, sockeye and coho, salmon). Map 6 indicates those streams in the planning area which have fish, or the potential to support fish.

The Deschutes River, with a stabilized flow from upstream impoundments, has a good to excellent aquatic habitat condition. In contrast, the John Day River, influenced by drastic flow fluctuations, caused by high spring runoff and summer water withdrawals on private land, has a fair to poor habitat condition. Aquatic habitat condition for the tributaries ranges from good to poor. Tables 17 and 18 summarize fish habitat condition and trend for the Deschutes and John Day basins.

Streambank damage and poor water quality are major factors contributing to the degradation of aquatic habitat. Besides the drastic flow fluctuations on the John Day River due to spring runoff, approximately 30 percent (42 miles) of its bank on public land is actively eroding. Water quality varies from high turbidity and sediment loads at high spring runoff to low summer flows and high water temperatures. Water quality measurements are shown in Appendix M.

Livestock Grazing

All grazing is regulated under Section 15 of the Taylor Grazing Act. In the planning area, 17,778 Animal Unit Months (AUMs) of livestock use are presently authorized on 233 allotments which contain 292,736 acres of public land. Map 7 and Table 19 show those allotments in the I and M categories. There are 211 lessees who graze livestock in these allotments. Six allotments are for sheep and the rest are for cattle, as shown in Appendix E.

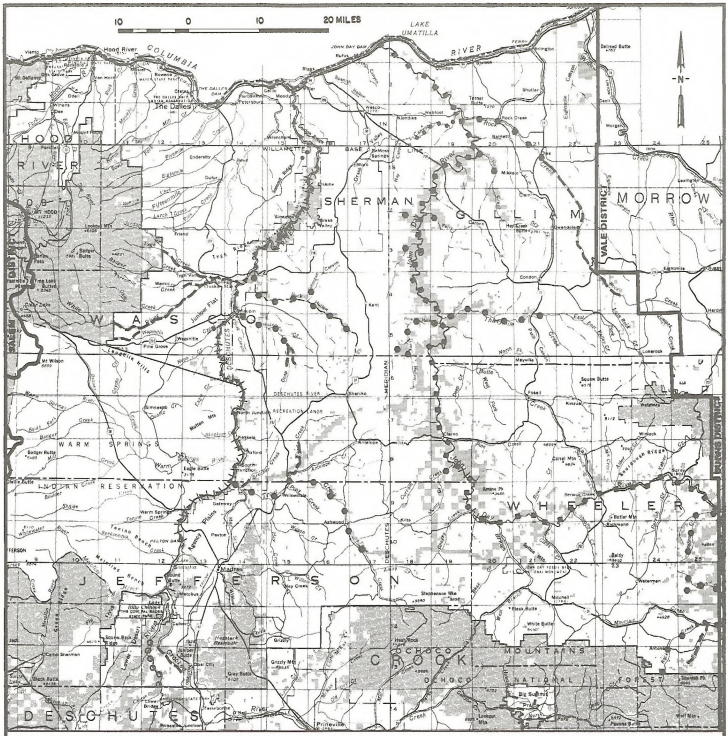
Twenty four allotments are being grazed under Coordinated Resource Management Plans (CRMPs) or some other documented type of grazing

Table 17 Fish Habitat Condition (Miles on Public Land)

	Excellent	Good	Fair	Poor	Total
Deschutes Basin	71	13	29	4	117
John Day Basin	0	3	75	52	130
Total	71	16	104	56	247

Table 18 Fish Habitat Trend (Miles on Public Land)

	Improving	Stable	Declining	Total
Deschutes Basin	10	103	4	117
John Day Basin	3	118	9	130
Total	13	221	13	247



Steelhead and Rainbow Trout Spawning, Rearing and Holding Areas

Steelhead Spawning Area

Chinook Spawning Area

Rainbow Trout

Anadromous Fish, Trout and Warm Water Fish Immigration, Holding and Spawning Areas (Deschutes River)

Anadromous Fish and Warm Water Fish Immigration, Holding and Spawning Areas (John Day River)

Trout, Char, Salmon and Warm Water Species

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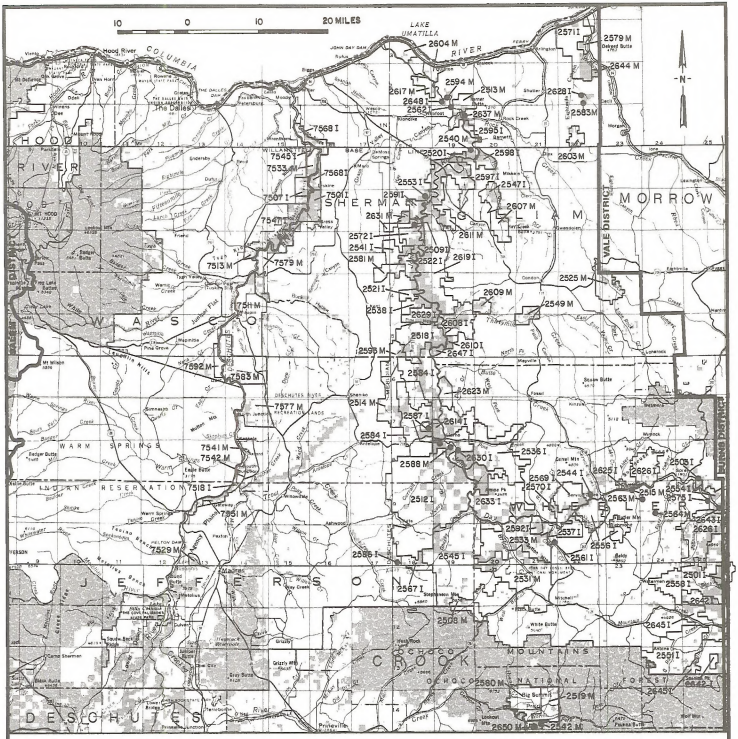
MAP 6

Fish Habitat



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- Allotment Areas
- 2536 Allotment Number
- I Improve Category
- M Maintain Category

The remaining unmarked parcels of public land are either custodial category (C) allotments or unallotted areas.

MAP 7
Grazing Allotments (I and M Category Only)

Table 19 Grazing Allotment Summary

Category	Number of Allotments	Public Land Acres	Existing Authorized Use-AUM's
I -- Improve	59	183,692	9,415
M -- Maintain	41	52,534	3,774
C -- Custodial	133	56,510	4,589
	233	292,736*	17,778

* Leased Acres

management. These allotments account for 20 percent of the leased acres and 19 percent of the AUMs in the planning area.

Herds of wild, free roaming and trespass horses once existed on public land in the North Pole Ridge, Spring Basin, Muddy Creek and Cherry Creek areas. In the past 12 years, the horses have been removed.

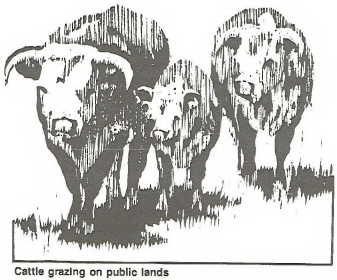
Forestland

There are 32,323 acres of public forestland managed by BLM in the Two Rivers Planning Area. An Operations Inventory of forestland, which includes a Timber Production Capability Classification (TPCC) system, was completed in 1984. The TPCC process determined that 11,010 acres of forestland in the planning area are suitable for commercial timber production. That acreage reflects a 2,024 acre reduction from the total noted in the Proposed Land Use Alternatives brochure published in September 1984. The reduction resulted from TPCC work completed after the brochure was published. Also, 1,715 acres of commercial forestland suitable for timber production in Big Summit Prairie, have been added.

The remaining 21,313 acres include noncommercial forestland and commercial forestland determined nonoperable for timber production. Map 8 & Table 20 show, by general geographic location and county, forestland acreage suitable for timber production.

The predominant commercial timber species are ponderosa pine and Douglas fir. Commercial timber stands vary in age, size and species composition, depending on environmental factors and past management practices. Nearly all forestland suitable for timber production has been cut over, but small, scattered stands of virgin old growth do occur.

Of the acres unsuitable for timber production, an undetermined number are suitable for production of minor forest products such as posts, poles, firewood, etc. Past demand for such products has been low.

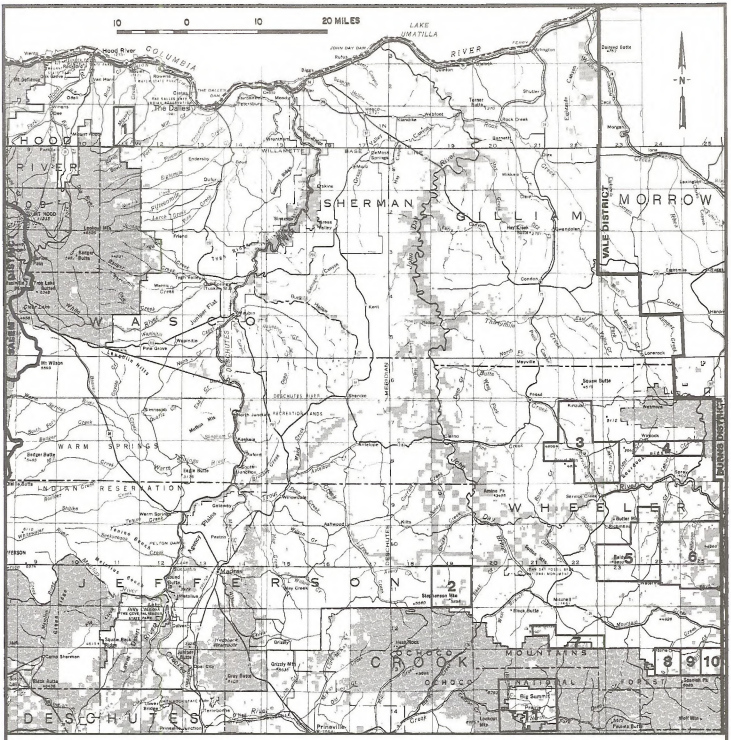


Cattle grazing on public lands

Table 20 Forestland by County (Acres of Public Land)

County	Total Forestland (acres)	Acres Unsuitable For Timber Production		Acres Suitable for Timber Production[1]
		Noncommercial Forestland	Nonoperable Forestland	
Crook	4,788	3,073	0	1,715
Jefferson	3,265	1,758	191	1,316
Hood River	262	0	262	0
Wasco	1,494	0	1,220	274
Wheeler	22,514	14,767	42	7,705
Totals	32,323	19,598	1,715	11,010

[1]Forestland capable of producing merchantable timber at rates of at least 20 cubic feet per acre per year that is currently, or prospectively, accessible and not withdrawn from such use.



Area		Acres Suitable for Timber Production
1	Mosier Creek	274
2	Stephenson Mtn.	1,316
3	Kinzua	1,044
4	Spray	282
5	Baldy Mountain	526
6	Johnson Heights	3,365
7	Mitchell	261
8	Rock Creek	549
9	Birch Creek	1,216
10	Day Creek	462
11	Big Summit Prairie	1,715
	Total	11,010

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MAP 8
Areas Suitable for Timber Production

Energy and Mineral Resources

North Central Oregon is in parts of two physiographic provinces: the Columbia Plateau and the Blue Mountain. Significant geologic formations in the area include the Clarno Formation, John Day Formation, and the Columbia River Basalt Group.

The Columbia River Basalt Group covers most of the northern two thirds of the planning area. The formation averages 2,000 to 3,000 feet in thickness. It forms the walls of the Columbia River Gorge, the Deschutes River Canyon and the John Day River Canyon. It is the youngest of the three major formations and overlies the John Day and Clarno Formations. The Columbia River Basalt Group is composed primarily of continental flood basalts of Miocene age. The basalts are generally dense, black, and fine grained with subordinate tuffaceous sediments.

The John Day Formation is of Oligocene to early Miocene age. It is widely known for its abundant, well preserved plant and vertebrate animal fossils. Approximately 3,000 feet of varicolored siltstones, claystones, and vitric tuffs make up most of the formation. The formation is widespread in the southern half of the planning area, particularly in the Antelope/Ashwood area, Sutton Mountain, and the John Day Valley north of Picture Gorge.

The Clarno Formation underlies the John Day Formation and is of late Eocene to early Oligocene age. The Clarno Formation has an aggregate thickness of several thousand feet. It is characterized by a variety of volcanic and related terrestrial rocks, including mafic lava flows, coarse unsorted breccias, mudflows, tuffaceous sediments and silicic domes. The formation is widespread in the south central portion of the planning area.

Most of the area is potentially valuable for oil and natural gas resources, however, past exploration activity has been sporadic. Active drilling within the planning area does indicate a good potential for the discovery of oil and gas resources.

Varying amounts of gold, silver, mercury, pozzolan, zeolites, perlite, and semiprecious stones have been produced from the area. Included in the semiprecious stone group are petrified wood, thundereggs (geodes), jasper, agate, and limb casts. Several areas shown on Map 9, are classified potentially valuable for geothermal, oil and natural gas, and locatable minerals within the planning area. The locatable mineral potential zone was delineated by the approximate zone of contact between the Columbia River Basalt Group and the older Clarno and John Day formations.

Essentially, all of the Federal mineral estate in the planning area has been leased for oil and natural gas. Actual acreages and numbers of leases are in a state of flux as leases are dropped and new leases are acquired. Recent exploration activity has included some seismic work with one deep well proposed a few miles east of the planning area and one well which has been drilled on private land (as of January 1985) in the southeastern portion of the area.

The potential for discovering locatable minerals such as gold, silver, and mercury is good in the south and eastern portions of the planning area. Table 21 lists locatable minerals and the areas where mining activity has occurred. There were 432 mining claims on Federal mineral estate in the planning area as of January 1985.

Salable mineral materials include sand, gravel and stone. There have been no recent sales of sand or gravel because of low demand, sparse population and distance from major markets. State highway and county road departments hold several material site permits on public lands for local use in maintaining roads.

Silver and mercury are currently on the strategic and critical materials stockpile list. Many of the minerals on the list are rare in the United States, and foreign sources must be depended on for supply.

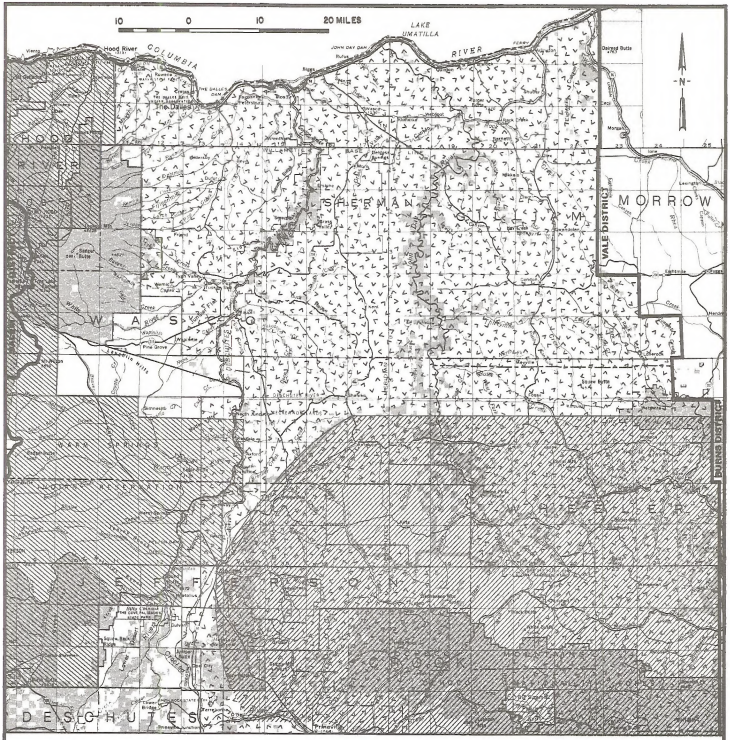
Table 21 Major Minerals in Planning Area

Commodity	Area
Mercury*	Horse Heaven Creek Mines, Gray Butte, area around Big Summit Prairie
Gold, Silver*	Spanish Gulch Mining District, King Mine at Ashwood
Perlite	Dant and Russell Mine on the Deschutes River
Diatomite	South of planning area at Lower Bridge

*Strategic and critical minerals

Land Tenure and Access

Lands remaining in public ownership are generally those lands which were either unsuitable for development under the various homestead laws or were withdrawn from homesteading programs for other purposes. Withdrawals for powersite potential along the Deschutes, White, Crooked, John Day and Columbia rivers remain in public ownership within those respective canyons. The remainder of public lands are generally scattered parcels unsuitable for agricultural entry, many of which have no legal access. Stock driveway withdrawals along ridges form linear blocks of public land with limited access.



Areas of High Locatable Mineral Potential

Areas Potentially Valuable for Geothermal Resources 1/

Areas Potentially Valuable for Oil and Gas 1/

1/ Source:
USGS Conservation Division, Western Region Map
March 5, 1976.

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MAP 9
Minerals Potential

Land Use Authorizations

Major uses of public lands are for rights of way, hydroelectric impoundments and agricultural permits. Rights of way have been issued for communication sites, access roads, water pipelines, electrical distribution lines, electric transmission lines, and natural gas transmission pipelines. Hydroelectric impoundments within the planning area are found on the Columbia, Deschutes, White and Crooked rivers.

Lands along the John Day River have been withdrawn by the Federal Power Commission and the U.S. Geological Survey for power site purposes, however, there are no developments or current proposals.

Agricultural use of public lands has occurred without authorization in conjunction with activities on adjacent private lands. Unauthorized agricultural use has been handled by either stopping the use and reclaiming the land or by issuing temporary permits to continue use. Approximately 75 parcels, involving 750 acres of public land, are under cultivation. There are presently seven permits for agricultural use, involving approximately 100 acres.

Land Sales and Exchanges

Sales of public land are currently restricted to Gilliam County. Several private exchanges are in various stages of completion. The Oregon State Parks and Recreation Division of the Department of Transportation has applied for public lands within The Cove Palisades State Park through exchange and purchase under the Recreation and Public Purposes Act.

Public Access

Access to public land ranges from excellent highways to no legal or physical access. Past easement acquisitions have been concentrated along the Deschutes River for recreation access and in forested areas for easements to tracts of commercial timber. Public land adjacent to the Deschutes and John Day rivers is legally and physically accessible since the rivers are public water highways for boaters.

Utility and Transportation Corridors

Utility and transportation corridors through the planning area have been established by existing use. Major highways, electric transmission lines, natural gas transmission pipelines and railroads have been identified and designated as corridors. Widths vary, but are a minimum of 200 feet. The Western Regional Corridor Study of May 1980 identified corridor needs through the year 2020. Corridor needs identified by the group follow existing rights of way, as shown on Map 10. Existing highway, powerline and pipeline crossings of the Deschutes and John Day river canyons are routes for crossing in sensitive visual areas. Routes of national and regional significance include the Pacific Northwest/Pacific Southwest Intertie Electrical Transmission System operated by Bonneville Power Administration and the Arctic Natural Gas Transportation pipelines (existing and proposed) operated by the Pacific Gas Transmission Company.

The Burlington Northern Railroad route in the Deschutes River Canyon is considered a single purpose transportation corridor and will remain so because of the high visual and recreational values in the canyon.

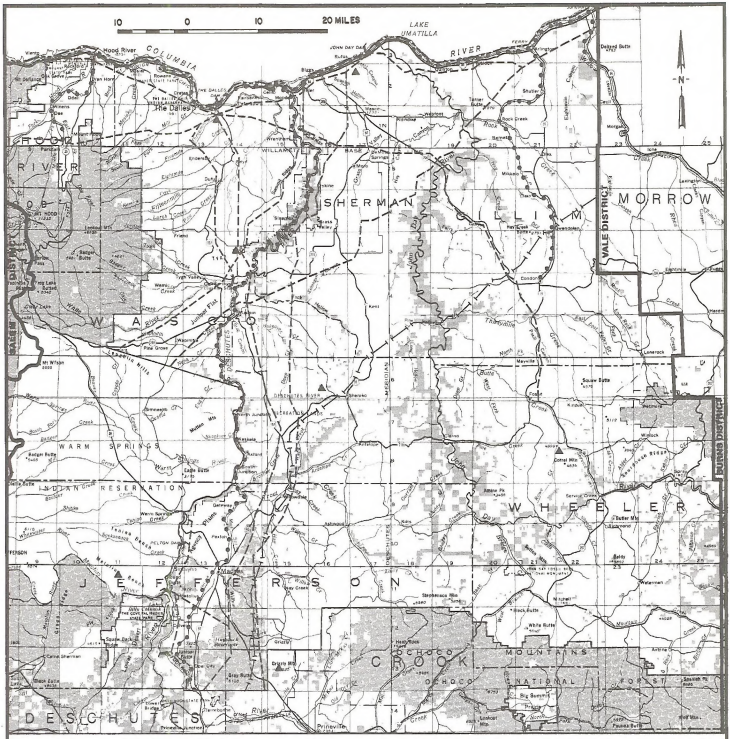
Economic Conditions

Zones of economic influence were established in order to analyze economic consequences resulting from the proposed alternatives. The zones are the seven counties in the Two Rivers Planning Area—Gilliam, Crook, Hood River, Jefferson, Sherman, Wasco, and Wheeler.

Population, Income and Employment

The population in the seven counties was 67,999 persons in 1980. This amounted to less than 3 percent of the population of the state and is shown in Table 22. The major trade center in the planning area is The Dalles.

Total personal income for the seven counties in 1982 was $704.6 million, which amounted to 3



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— — — Electric Transmission Line

⊢—⊢ Natural Gas Transmission Pipeline

• • • • Railroad

⌒ Hydroelectric Impoundment

▲ Communication Site

MAP 10
Utility/Transportation Corridors
Communication Sites

percent of the total personal income for Oregon. Employment by source for the seven counties is shown in Table 23. The distribution of employment by industrial source varies among the counties. Agriculture is a major employment factor in Gilliam, Sherman and Wheeler counties. Agriculture, the timber industry and other manufacturing are major employment factors in Crook, Hood River and Jefferson counties. The timber industry, manufacturing, retail trade and services are major employment factors in Wasco County.

Economic Relationships

Minerals

Leasable minerals include oil, gas and geothermal resources. There are oil and gas leases over essentially the entire planning area with lands currently leased at $1 per acre per year. Fifty percent of oil and gas lease fees go to the State and local governments. There are no geothermal leases. Locatable minerals which are actively mined from unpatented mining claims include, but are not necessarily limited to gold, silver, mercury, perlite, and diatomite. Salable minerals include sand and gravel.

There is no information on the amount of income, deposits, or production from mining operations on public lands.

Forest Products

Forestlands that are suitable for commercial timber production in the planning area cover 11,010 acres. The current sustainable harvest level is approximately 1.43 MMbf per year—a harvest level that amounts to less than 1 percent of the total annual harvest for the seven county area. Timber harvest for the seven counties from all sources averaged 280 MMbf between 1978 and 1983. Timber harvest for the State of Oregon averaged 6,871 MMbf.

Dependence of Livestock Lessees on Public Forage

There are 233 grazing allotments and 211 livestock operators authorized to use public forage in the planning area. The allotments in the planning area are mainly scattered parcels of public land intermixed with private land. There are now 17,778 AUMs of authorized use. In 1983, total receipts to BLM from livestock grazing leases amounted to approximately $24,000. Fifty percent of the grazing lease fees collected annually are distributed to the county in which they originated.

The dependence of ranch operations on BLM forage is determined by the total amount of required forage available from public lands; seasons when forage is available; and the availability of forage substitutes.

The average annual dependence of these operators, according to herd size categories is shown on Table 24. This dependence is calculated by dividing active use for a herd size class by the total forage requirements for the class (12 times the number of cattle involved) and converting to a percentage. The average ranch is about 3 percent dependent on BLM forage. This analysis is based on active use for at least one month during the grazing season. Three ranches in the smallest ranch size category are 100 percent dependent on public land at some time during the year.

There may be a capitalized value associated with grazing leases which could only be realized at the time of the sale of the ranch. The BLM does not recognize the right of the lessee to treat grazing leases as real property. However, effects on private asset valuation may occur. The Oregon State Office appraisal staff estimated that the value for BLM grazing leases is approximately $60 per AUM.

Wheat field on the Columbia Plateau

Table 22 Population by County (1960 to 1980)

	Gilliam	Crook	Hood River	Jefferson	Sherman	Wasco	Wheeler	Oregon
1960	3,069	9,430	13,395	1,130	2,446	20,205	2,722	1,768,687
1970	2,342	9,985	13,187	8,548	2,139	20,133	1,849	2,091,533
1980	2,057	13,091	15,835	11,599	2,172	21,732	1,513	2,633,105

Source: U.S. Department of Commerce, Bureau of the Census, 1980 Census of Population

Table 23 Employment by Source, 1982

	Gilliam	Crook	Hood River	Jefferson	Sherman	Wasco	Wheeler	Oregon
Totals*	1,182	3,697	8,670	5,857	1,214	9,990	619	1,168,384
Proprietor								
Farm	274	450	744	544	330	766	159	41,395
Non Farm	127	580	738	579	106	983	101	119,935
Wage and Salary								
Farm	284	374	1,298	452	187	852	82	26,524
Non Farm								
Agricultural Services	**	47	155	59	**	**	**	9,500
Mining	0	0	**	***	0	**	0	1,836
Construction	***	66	147	141	**	198	**	28,772
Manufacturing	**	153	1,159	792	**	1,261	15	186,055
Transportation and Public Utilities	**	**	485	77	**	313	10	56,291
Wholesale Trade	35	**	**	222	25	265	***	62,475
Retail Trade	76	440	971	582	**	1,528	49	176,030
Finance, Insurance and Real Estate	19	88	123	84	179	207	10	57,498
Services	91	548	1,221	1,337	88	1,710	22	162,206
Government								
Federal, Civilian	12	295	95	125	105	419	18	29,252
Federal, Military	***	42	49	37	***	73	***	10,343
State and Local	160	538	810	784	146	1,266	130	162,206

*Consists of Wage and Salary Jobs (full and part time) plus number of proprietors.

**Not shown to avoid disclosure of confidential data.Data are included in totals.

***Less than 10 jobs.

Source: Regional Economic Information System, Bureau of Economic Analysis, 1984.

Table 24 Annual Lessee Dependence on BLM Forage by Herd Size

Herd Size Class	Number of Lessees In Class	Lessees by Level of Dependence 1-15%	16-30%	31-45%	Average Dependence (%)
0-399	171	157	11	3	4
400-999	28	28	-	-	3
1000+	12	12	-	-	1
Total	211	197	11	3	3

Agricultural Lands

Approximately 750 acres of public land in the Two Rivers Planning Area are being used for agricultural purposes. This land is in two categories, based on location: upland and lowland. The upland areas, about 450 acres, are not irrigable and typically are used to produce grain crops or grass hay. The lowland areas, about 300 acres, are commonly irrigated and produce pasture and alfalfa. These lands are near the John Day River.

Not all of the tracts being used for agricultural purposes have been identified, but most are estimated to be 10 acres or less in size. Present use results from unmarked land ownership boundaries. Cultivation on adjacent private lands sometimes includes public land when soil conditions and contours encourage the extension of cultivation.

Farm or ranch operations cultivating these public lands are typically large, involving more than 1,000 acres and sometimes several thousand acres. Crops grown on the public land produce an estimated $80,000 per year in net income above cash costs (based on county tax assessor data for the counties involved). None of the users are known to be substantially dependent on the tracts for their income. On a per acre basis, upland areas produce about $126 per crop year and lowland areas produce about $90 per crop year.

Recreation

Whitewater boating, fishing, sightseeing, and camping on the Deschutes and John Day rivers are the dominant recreation activities accounting for 86 percent of the total recreation use on public lands within this planning area. Table 25 summarizes estimated public land recreation use within the planning area. Recreation use of both the Deschutes and John Day rivers is not included in this analysis for the reasons described below.

Recreation River Use of the Lower Deschutes and Lower John Day Rivers

Recreation use of the lower 100 miles of the Deschutes River, a component of the Oregon State Scenic Waterway System, has been studied by several agencies. Management challenges can only be resolved by continuing coordination of activities between the BLM, Oregon State Parks and Recreation Division of the Department of Transportation, Oregon Department of Fish and Wildlife, Oregon State Marine Board, Confederated Tribes of the Warm Springs Indian Reservation, private landowners and Jefferson, Sherman and Wasco counties. This group has developed plans for recreation management of this river corridor downstream from Warm Springs.

The lower 147 miles of the John Day River, also a state scenic waterway, will require a specific plan for managing recreational use downstream from Service Creek. Issues such as recreation use levels, recreation facilities and trespass are very specific concerns and are beyond the purpose and intent of a more general resource allocation plan such as an RMP. Recreation planning on the John Day River also needs to be accomplished jointly with other managing agencies and with the public.

The remaining public lands in the planning area provide opportunities for quail, chukar and deer hunting, fishing, rockhounding, off road vehicle driving and other activities (Table 25). Many areas where these popular recreation activities occur are identified in Appendix Q.

Off Road Vehicle Use

Off road vehicle (ORV) use in the planning area is primarily associated with other recreation activities, such as hunting, fishing or rockhounding. The steep, rocky terrain confines most vehicle travel to existing roads and trails. Most ORV use on public land in the planning area occurs adjacent to small towns and in popular recreation areas as shown on Map 11. A limited amount of cross country ORV use

Table 25--Estimated Public Land Recreation Use (Visitor Days)[1]

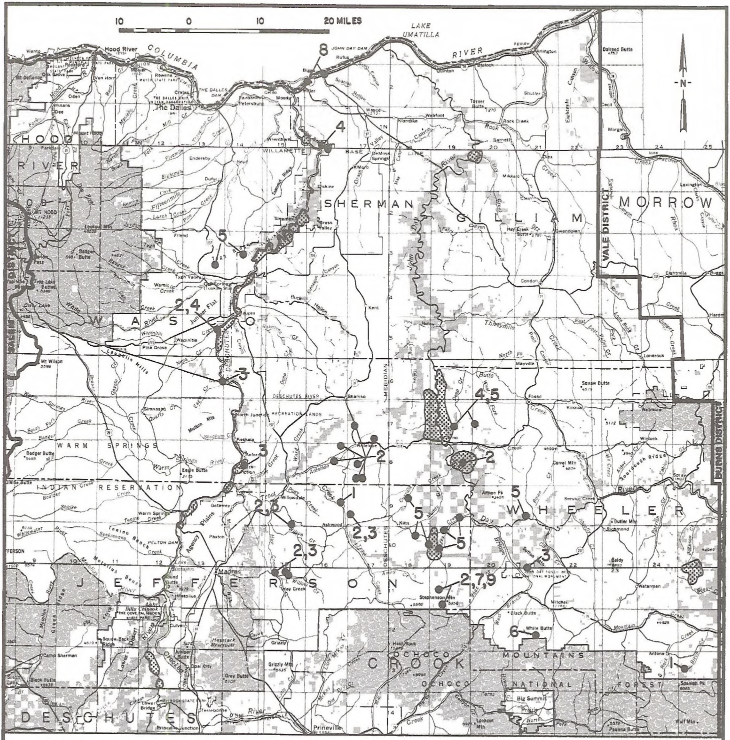
River Recreation[2]	
Deschutes River	360,000
John Day River	18,000
Subtotal	378,000
Recreation Use on Remaining Public Lands (Visitor Days)[1]	
Hunting	35,000[3]
Fishing	8,000[3]
Rockhounding	10,000
Off Road Vehicle	1,000
Other 4/	8,000
Subtotal	62,000
Total Public Recreation Use	440,000

[1]A visitor day is any portion of a 12 hour period by a person participating in a one or more recreation activities.

[2]Includes rafting, camping, fishing, rock/fossil collecting, hunting, sightseeing, photography, off road vehicle driving and picnicking.

[3]Data from Oregon Department of Fish and Wildlife.

[4]Includes photography, sightseeing, driving for pleasure, and target shooting.



MINERAL TYPE

1 Gold and Silver
2 Agate
3 Thunder Eggs
4 Petrified Wood
5 Plant Fossils
6 Marine Fossils
7 Opal (Fire)
8 Wascoite
9 Dendritic Nodules

Areas Presently Being Used by Off-Road Vehicles

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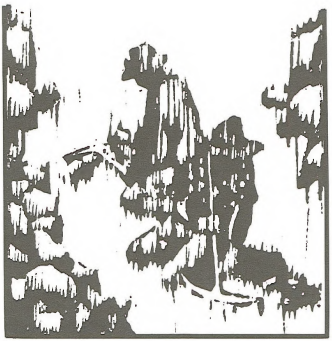
MAP 11

Off-Road Vehicle Use and Areas Having Rockhounding Potential (Moderate or High)



Rockhounds digging in agate beds near Antelope

does occur, expecially during hunting season in a number of areas. Historically, there has been no demand for organized events in the planning area. Organized off road vehicle events are popular, however, in the BLM Millican Valley ORV Recreation Area south of the planning area and east of Bend, Oregon.

Rockhounding

Rockhounding is a popular recreation activity in the planning area as indicated on Table 25. Rock collectors generally explore in the Clarno, Antelope, Fossil, Cherry Creek, John Day River and Deschutes River areas as shown on Map 11.

Some public lands in the area have high quality minerals which include green, plume, iris, white tube, red moss, "bean", botryoidal and blue ice agate. Other collectible minerals include brown, pastel, and agatized petrified woods, varieties of jasper, such as wascoite, bog and jasper agate. There are some areas where trace amounts of opal, crystal, gold and silver can be found. Fossils, petrified wood, fruits, leaves, nuts, seeds and silicified woods are also found in the John Day River and Deschutes River canyons. Appendix R describes those public land areas containing collectible mineral, plant or invertebrate fossils.

Public roads provide access to many areas. Public access to other lands is limited in some cases because private lands sometimes surround public lands. Some private landowners open their lands in other areas where collectible minerals are found.

Cultural Resources

The BLM is required to identify, evaluate, and protect cultural resources and to insure that actions do not inadvertently harm or destroy federal or non federal cultural resources. Sites are evaluated to determine if they are eligible for addition to the National Register of Historic Places.

A complete survey to identify cultural resources eligible for the National Register has not been feasible because of the amount of public land in the Two Rivers Planning Area. A review and compilation of existing data was written in 1979 and a sample survey was also completed in the Cherry Creek Area. The amount of land surveyed totals about 5 percent of the public land in the planning area. Cultural resource inventories on the Two Rivers Planning Area were conducted in accordance with the Programmatic Memorandum of Agreement between BLM and the Advisory Council on Historic Places, January 14, 1980.

Paleontology

A literature search conducted in 1981 identified 43 paleontological sites in the Two Rivers Planning Area. Sixteen of these known sites are located on or near public lands. Most sites contain vertebrate fossils as well as invertebrate and plant fossils. The John Day Fossil Beds National Monument was created to recognize and manage some of the internationally significant paleontological resources found in the planning area. The potential is very high for the discovery of additional paleontological sites on public lands.

Prehistory

Human use of the Two Rivers Planning Area extends back at least 10,000 years. The native inhabitants followed a fishing, hunting, and gathering lifestyle until most were moved to the reservation of the Confederated Tribes of Warm Springs in the 1850s. The influences of Columbia Plateau and Great Basin cultures are evident in the archaeological record.

There have been 229 prehistoric sites recorded on public land in the planning area. Nearly one third are housepit sites, which generally indicates a semi permanent village. About one fifth are rock shelter sites, which may have been used for storage or habitation. Another one fifth are lithic scatters. Other known prehistoric sites include campsites, middens, pictographs, quarries, and rock features. About half the sites are in excellent to good condition with the rest ranging from fair to disturbed. Illegal digging for artifacts has impacted

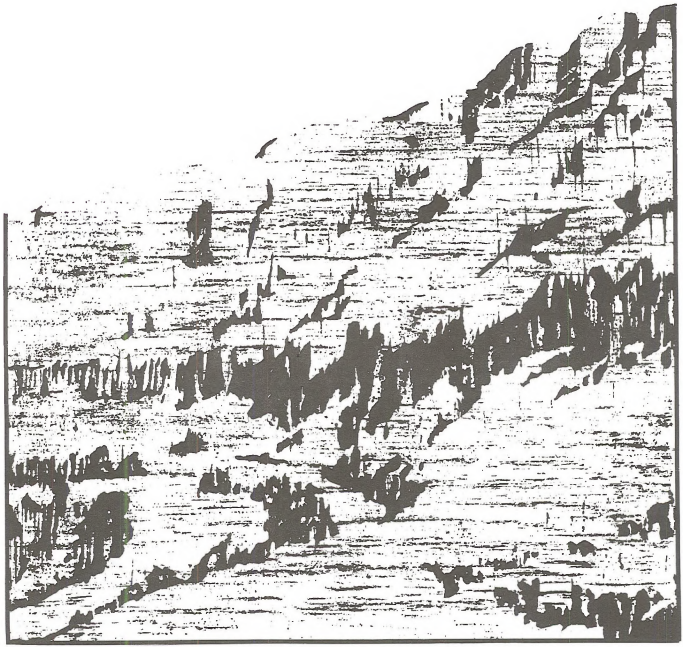
nearly half the sites and is the most serious form of disturbance. Other significant sources of disturbance include concentrated recreation use, farming, livestock hoof action and erosion.

One prehistoric site listed on the National Register of Historic Places is the Macks Canyon site, a major stratified village site on the Deschutes River. It was partly excavated by University of Oregon archaeologists in the late 1960s. Nine additional prehistoric sites or districts have been identified as potentially eligible for addition to the National Register.

None of these have been tested to determine subsurface extent but most are housepit sites which likely contain stratified deposits with high information content. Completion of cultural resource management plans are scheduled for the next few years for the Deschutes and John Day river corridors.

History

Euroamerican use of the Two Rivers Planning Area has left evidence spanning a century, beginning with early 19th century exploration and fur trapping expeditions. Historic activity through the 1930s has been documented. It includes settlement,



The Deschutes River Canyon near Cedar Island

agriculture, road and railroad construction, and mining.

Sixty four historic sites have been documented on public land in the planning area. About one third of the sites are buildings that represent settlement associated primarily with agriculture, stockraising, and mining. Another one third are buildings and features associated with railroads in the Deschutes River Canyon. Other known historic sites include canals and flumes, cemeteries, dumps, rock features, wagon roads, and mines.

The Spanish Gulch Mining District has been judged eligible for addition to the National Register of Historic Places. After gold was discovered there in 1860 the locale had some of the earliest concentrations of historic activity on public land in the planning area.

Four other historic districts have been identified as potentially eligible for the National Register. Two are parts of the Oregon Trail and the others are significant early wagon roads.

Visual Resources

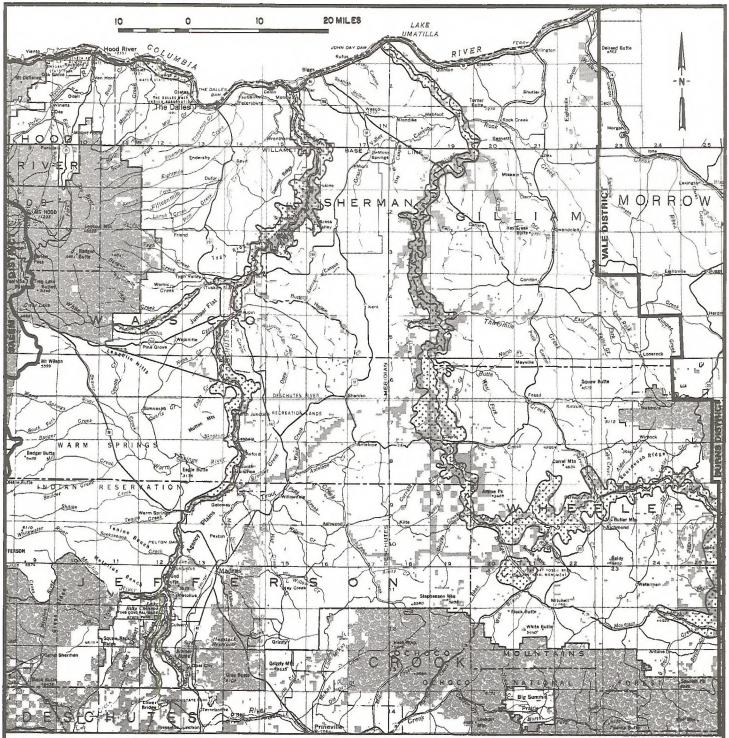
Approximately 149,000 acres of public land in the planning area possess high visual quality as shown on Map 12. Nearly all of the lands possessing high visual quality are located in the Deschutes, John Day, Crooked and White River canyons. These areas contain sheer, basalt cliffs, pillars, escarpments and other dramatic geological formations giving the areas an unusual significance. In many areas the canyon walls rise more than 1,000 feet from the river beds. Riparian vegetation along the banks add interesting contrasts to the otherwise arid character of these areas. Although areas such as Sutton Mountain do not have the same characteristics they do have high visual quality and interesting geological features highlighted by their size and diversity of vegetation and coloration.

Another 175,000 acres of public land possess limited visual qualities because of a lack of diversity in the landscape, vegetation, water, or color. They may also contain unnatural intrusions.

Special Management Areas

Areas involving special resource qualities that may need different or more intense management practices to protect or enhance unique qualities are called Special Management Areas. There are several types of resource management designations that can be used to accomplish specific management objectives for these areas. These designations include: area of critical environmental concern (ACEC), outstanding natural area (ONA) and research natural area (RNA).

Areas considered for these designations include; "The Island" (located within The Cove Palisades State Park); the Deschutes and John Day State Scenic Waterways; the Horn Butte and White River Wildlife areas; the John Day River State Wildlife Refuge; the Red Wall area on the John Day River; the two botanical/scenic areas within the Columbia Gorge; The Dalles watershed; the Governor Tom McCall Preserve at Rowena; the Oregon Trail Historic Site at Fourmile Canyon and McDonald Crossing Historic Site; the Spanish Gulch Historic Mining District; and the Macks Canyon Archaeological Site. These areas are shown on Map 13. The special qualities, general location and approximate size of these areas are summarized in Table 26. Special values on a portion of Sutton Mountain and other historic trails have also been identified and considered.



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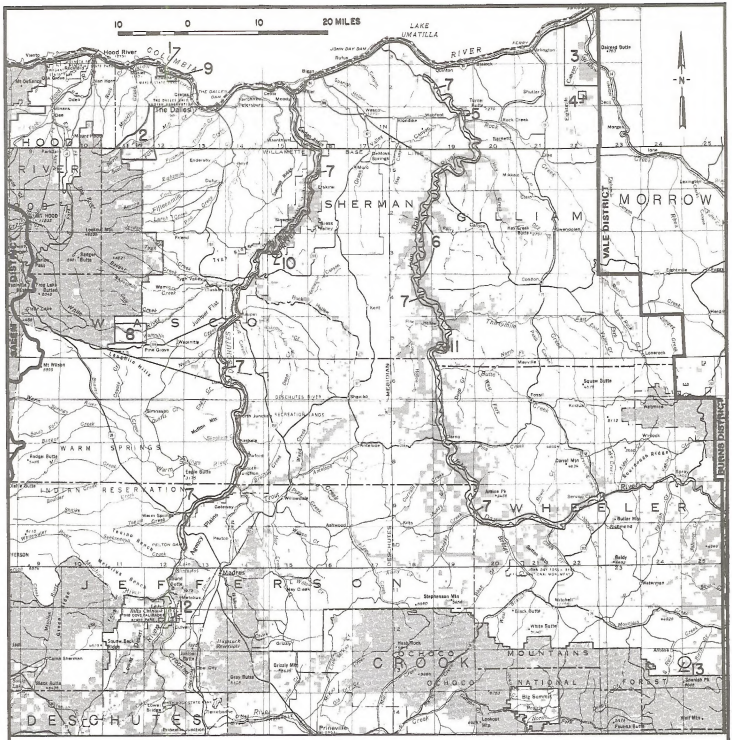
Areas of High Visual Quality

MAP 12
Areas of High Visual Quality

Table 26 Summary of Special Management Area Resource Values

Area Name	General Location	Special Resource Values	Public Land Acreage
Deschutes and John Day River Canyons, including the Red Wall Scenic Area.	The lower 100 miles of the Deschutes River downstream from Pelton/Round Butte Dam and the lower 147 miles of the John Day River downstream from Service Creek.	Outstanding natural and scenic values. Both rivers contain important riparian habitat, recreation and watershed values. Both rivers have been designated as Oregon State Scenic Waterways.	139,000 acres
The Island in The Cove Palisades State Park	The Cove Palisades State Park, southwest of Madras	The best remaining example of the western juniper/big sagebrush/ bluebunch wheatgrass ecotype plant association in the region. It is also a raptor, deer, and waterfowl use area and contains outstanding scenic vistas of Lake Billy Chinook and the Cascades. Used as a hiking area.	250 acres (170 acres, BLM;80 acres, USFS)
The Governor Tom McCall Preserve and the two botanical/scenic areas within the Columbia Gorge.	Rowena Area.	Contains Idaho fescue/hawkweed and Columbia Gorge forest complex ecotypes or plant associations. Four rare plants are also within this preserve. High visual qualities also are present and can be seen from both Oregon and Washington highways within the gorge.	12.5 acres within preserve. Two parcels totalling 76 acres outside the preserve.
John Day River State Wildlife Refuge.	From the junction of the Columbia River, upriver 84 miles to Thirtymile Creek.	A protection and resting refuge for ducks and geese during hunting seasons. Sensitive raptor species, significant wilderness and cultural values also exist.	26,880 acres
White River Wildlife Area	Northwest of Maupin.	Primary wintering area for Roosevelt/ Rocky Mountain elk and black tailed deer. Important riparian and aquatic habitat. High primitive recreation values also exist.	1,360 acres BLM/ 26,640 acres Oregon Department of Fish and Wildlife).
Horn Butte Wildlife Area	East of Arlington	This area provides important nesting habitat for the long billed curlew, due to a bluebunch wheatgrass, Sandburg bluegrass, needlegrass, snakewood and gray rabbit-brush habitat type.	4,300 acres
The Dalles Watershed	Southwest of The Dalles on the South Fork of Mill Creek.	This area is an important part of The Dalles Watershed, which is the primary water source for the City of The Dalles. Area also provides winter habitat for Roosevelt/Rocky Mountain elk, blacktail deer and wild turkey.	410 acres
Oregon Trail Historic Sites at McDonald and Fourmile Canyon	McDonald is southwest of Arlington. Fourmile Canyon is southeast of Arlington.	Both areas contain well preserved segments of the Oregon Trail, including covered wagon wheel ruts.	McDonald; 400 acres Fourmile Canyon; 24 acres
Macks Canyon Archaeological Site	North of Maupin, adjacent to the BLM Macks Canyon Campground.	This site contains a large stratified Native American village that has been partly excavated. An interpretative panel is located at the site. Macks Canyon Campground is adjacent to this site.	25 acres
Spanish Gulch Mining District	West of Dayville.	This mining district is an important historic gold mining area dating back to the mid 1800s. Remnants of early mining activities include an old stamp mill, mineshafts and several old cabins.	335 acres



1. Governor Tom McCall Preserve at Rowena
2. The Dalles Watershed Area
3. Horn Butte (Curlew) Wildlife Area
4. Oregon Trail Historic Site at Fourmile Canyon
5. Oregon Trail Historic Site at McDonald Crossing
6. John Day River State Wildlife Refuge
7. Deschutes and John Day State Scenic Waterways
8. White River Wildlife Management Area
9. Botanical/Scenic Areas Within Columbia Gorge
10. Macks Canyon Archaeological and Recreation Area
11. Red Wall Scenic Area
12. The Island at The Cove Palisades State Park
13. Spanish Gulch Mining District

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1985

MAP 13

Special Management Areas

Chapter 4
Environmental Consequences

Adandoned homestead at Twickenham

Introduction

This chapter identifies, summarizes, and compares environmental impacts projected to occur as a result of implementing either Alternative A (Preferred Alternative), Alternative B (Commodity Production), Alternative C (Existing Management), Alternative D (Emphasize Natural Values with Commodity Production), or Alternative E (Emphasize Natural Values). Impacts are discussed in relation to two time frames: short term—where impacts are expected to occur during project implementation (up to 10 years after approval of this plan)—and long term—impacts which would result beyond 10 years. Unless mentioned otherwise, the discussion of impacts would be the same for both the short and long term.

Analysis indicates there would be no significant impact on paleontological resources, threatened or endangered wildlife species, air quality and energy use. They will not be considered further. Impacts as a result of agricultural use of public lands are discussed in the Economic Conditions section as appropriate. No other significant impacts would result from implementation of any of the Land Tenure and Access proposals under any of the alternatives.

The following assumptions have been made in this chapter:

1. Funding and personnel would be sufficient to implement any alternative described.

2. Monitoring studies would be completed as indicated, and adjustments or revisions would be made as needed.

3. Common management guidance would be followed.

4. Appropriate maintenance would be carried out to maintain the functional capability of all developments.

Impacts to Soil

Reductions in the amount of protective groundcover and any surface disturbances such as road construction or logging cause changes in soil characteristics. Depending on the degree of impact these changes adversely effect erosion rates, soil productivity, infiltration rates, soil moisture relationships, organic matter, surface soil structure, permeability, nutrient recycling and compaction. Table 27 summarizes impacts to soil resources for all alternatives, and also shows the greatest soil disturbances (erosion hazard) occurring under mineral and timber management because of road construction. These disturbances are nearly the same for Alternatives A, B, C and D. Beneficial impacts to soils resulting from improved riparian and streambank stability would occur under all alternatives except Alternative C. Improvements would be greatest under Alternatives A, D and E.

Impacts to Water

Surface runoff decreases with an improvement in ecological condition.

Under Alternatives A, D and E water quality would improve and runoff would be better distributed throughout the year (with lower peak flows and greater low flows) because of improvements to riparian vegetation and streambank stability. Under Alternative C water quality and runoff would be unchanged.

The emphasis on onsite use of soil water, vegetation production, and improvement of soil alluvial aquifers along stream channels under all alternatives would increase water quantity for other uses in the long term. Short term increases would not be as significant. No impacts are anticipated to regional groundwater aquifers. Although there is no potential for increased water yields, improved watershed conditions would occur under Alternatives A, B, D and E. Increased streambank stability would result in a slower and extended release of water, thus improving water quality, during the critical low flow periods of summer and early fall. Table 27 summarizes impacts to watershed values from management activities and practices.

Impacts to Vegetation

Vegetation Types

Stocking levels and grazing systems under the livestock program, and all aspects of other programs, would not have a significant effect on vegetation types. Any beneficial changes would result from sagebrush burning, seeding and fencing as discussed below.

Sagebrush control treatments proposed under Alternatives A, B, D, and E would affect vegetation types through removal of sagebrush and converting big sagebrush vegetation to bunchgrass or crested wheatgrass.

Construction of fences and spring developments would cause temporary disturbance to vegetation types under Alternatives A, B, D and E in the short term. The greatest disturbance, affecting approximately 175 acres, would occur under Alternative E due to 1,615 miles of fence

Table 27 Summary of Long Term Environmental Consequences for Soil and Water Resources

	Alternative A (Preferred)		Alternative B (Commodity Production)		Alternative C (Existing Management)		Alternative D (Natural Values w/Commodities)		Alternative E (Natural Values)	
	Soil 1/	Water-shed 2/ Values	Soil 1/	Water-shed 2/ Values	Soil 1/	Water-shed 2/ Values	Soil 1/	Water-shed 2/ Values	Soil 1/	Water-shed 2/ Values
Livestock Grazing										
1. Available Forage	NC*	NC	−L	−L	NC	NC	+L	+L	+L	+L
2. Grazing Systems	NC	NC	NC	NC	NC	NC	+L	+L	+L	+L
3. Range Developments										
a.Fences	+L	+M	+L	+L	NC	NC	+-M	+M	+-M	+M
b.Prescribed Burning	NC	+L	NC	+L	NC	NC	NC	+L	NC	NC
c.Spring Developments	+L	+M	+L	+M	NC	NC	+L	+M	NC	NC
Riparian										
1. Fencing	+L	+M	+L	+L	NC	NC	+L	+M	+-M	+M
Wildlife Habitat										
1. Stream Projects	+L	+M	NC	NC	NC	NC	+L	+M	+L	+M
2. Prescribed burning	+L	+M	NC	NC	NC	NC	+L	+M	+L	+M
Forestry Practices										
1. Road Construction	−L	−L	−L	−L	−L	−L	−L	−L	NC	NC
2. Timber Harvest	−L	−L	−L	−L	−L	−L	−L	−L	NC	NC
3. Site Preparation	−L	−L	−L	−L	−L	−L	NC	−L	NC	NC
4. Reforestation	+L	+L	+L	+L	+L	+L	+L	+L	+L	+L
5. Thinning	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Mineral Exploration										
1. Road Construction, exploration sites.	−L	−L	−L	−L	−L	−L	NC	−L	NC	NC
Recreation										
1. ORV use	NC	−L	−L	−L	NC	−L	+L	+L	+L	+L
2. Rockhounding	−L	−L	−L	−L	NC	NC	NC	+L	NC	NC

1/Term "soil" covers environmental consequences to erosion rates and soil productivity.

2/Term "watershed values" includes factors affecting quality, quantity (runoff) and channel stability.

NC= No Change
+ = Improving Trend
− = Declining Trend
L = Low
M = Moderate

construction. Long term impacts would be negligible.

Ecological Condition

Ecological condition would be impacted by livestock grazing, the exclusion of livestock, riparian management and the harvesting of forest products under all alternatives. These impacts are summarized in Table 28. Some minor impacts associated with new agricultural use adjacent to riparian areas could occur under Alternative B, but are not quantifiable at this time.

The main impact of the livestock grazing program would be through the implementation of grazing systems and how these systems meet, or do not meet, the needs of the plants. Where plant needs are met by allowing food to be stored in the roots, the plants tend to improve in vigor and to reproduce. The net effect would be improvement in ecological condition. Where these needs are not met, weakening and potential death of the plants is the result, and ecological condition will move away from climax.

Since livestock graze some plants heavier than others, adjustments of the stocking rate is not always the best method to improve plant vigor. More often, the key to improving the vegetation is in managing grazing timing and duration so that these highly utilized plants can recover. Some ways to accomplish that goal include allowing periodic rest from grazing, or by grazing early enough in the season that plants are allowed to regrow and complete their growth cycle. The long term effect each grazing system has on plants is discussed in Appendix G.

Burning of sagebrush to increase livestock forage would occur under Alternatives A and B, and for wildlife habitat under Alternatives D and E. The main effect of burning would be to change ecological condition at least one condition class toward climax. Areas seeded under Alternative B would change condition to "other."

Fencing or exclusion of substantial acreages of riparian zones under Alternatives A, B, D and E would change ecological conditions. For those riparian acres fenced, ecological condition would generally change to climax in the long term. Some areas on the John Day River, however, would not be expected to progress beyond mid seral stage in the long term because of the extremely variable stream flow which makes the establishment of riparian

Table 28 Existing and Predicted Long Term Ecological Condition, Plant Diversity and Livestock Forage

	Existing Situation		Alt. A (Preferred) Alternative)		Alt. B (Commodity Production)		Alt. C (Existing Management)		Alt. D (Natural Values w/Commodities)		Alt. E (Natural Values)	
Ecological Condition	Acres (000)	%	Acres (000)	%	Acres (000)	%	Acres (000)	%	Acres (000)	%	Acres (000)	%
All Vegetation Types												
Climax	25	8	24	7	24	7	17	5	24	7	24	8
Late Seral	107	33	168	52	166	52	101	31	166	52	175	54
Mid Seral	95	29	65	20	64	20	90	28	65	20	59	18
Early Seral	88	27	58	18	56	17	107	33	58	18	57	17
Unclass/Other	9	3	9	3	12	4	9	3	9	3	9	3
Total	324	100	324	100	324	100	324	100	324	100	324	100
Riparian Vegetation (Acres)												
Climax	223	18	1,024	80	821	64	368	29	1,024	80	1,024	80
Late Seral	196	15	0	0	0	0	140	11	0	0	0	0
Mid Seral	137	11	256	20	332	26	60	5	256	20	256	20
Early Seral	724	56	0	0	127	10	712	55	0	0	0	0
Total	1,280	100	1,280	100	1,280	100	1,280	100	1,280	100	1,280	100
Plant Diversity												
High	95	29	116	36	115	36	94	29	115	36	116	36
Low	220	68	199	61	200	61	221	68	200	61	199	61
Unknown	9	3	9	3	9	3	9	3	9	3	9	3
Total	324	100	324	100	324	100	324	100	324	100	324	100
Long Term Livestock Forage (AUMs)	17,778		19,920		24,217		17,778		13,834		0	

vegetation difficult, even with livestock grazing exclusion. Ecological condition would also improve in the short term but changes would not be as significant as those which would occur over the long term. For those areas not fenced, ecological condition is dependent on grazing management and present ecological condition of the riparian areas.

Under Alternative D, 82,208 acres would be excluded from livestock grazing to enhance important wildlife habitat and to remove cattle from the highly scenic areas of the John Day and Deschutes River canyons. As a result, ecological condition in these excluded areas would be expected to change one condition class toward climax where response is anticipated.

Forestry practices would affect ecological condition of the coniferous vegetation types through the cutting of trees and support activities, such as road construction. Timber harvest is proposed to varying degrees under all alternatives. Harvest levels, however, would be the greatest under Alternatives A, B, C and D.

The impacts to riparian vegetation are expected to be insignificant due to buffer strip provisions and withdrawals of acreage from the timber production base under all alternatives.

Harvesting alters existing forestland vegetation and affects future plant communities. The removal of shade and the soil disturbance are the major habitat modifications. Pioneer species may colonize disturbed ground, initiating secondary succession within the stand. Timber harvesting results in conversion of old growth, mature growth, and second growth communities to early successional stages. Continuing intensive timber management would not allow future forest stands within the intensive timber production base to achieve old growth status. Some plant species associated with older age timber stands could be permanently excluded from intensively managed forestlands.

Plant Diversity

Due to predicted changes in ecological condition, plant diversity would also change. As discussed in Chapter 3, plant diversity is greatest when vegetative communities are in mid to late seral ecological condition except for white oak and riparian communities. Table 28 shows acres of high diversity resulting from each alternative.

Sagebrush burning, while temporarily removing one species from some areas would increase diversity since a greater number of species would be the net result. Seeding would reduce plant diversity under Alternative B. Forestry practices would change plant diversity in those areas where timber harvesting occurred.

Threatened, Endangered, or Sensitive Plants

Beneficial impacts could occur to plants palatable to livestock located within proposed exclusion areas. The removal of livestock could allow these plants to expand into adjacent suitable habitat. However, livestock exclusion could favor plants preferred by livestock which may be in competition with sensitive plants. Without information about the response to grazing, the impact of proposed changes in grazing management cannot be predicted. Adverse impacts to threatened, endangered or sensitive plants resulting from ground disturbance by projects would be avoided by conducting intensive plant inventories of the planning area and modifying the design as needed in accordance with Bureau policy. However, unidentified populations of threatened, endangered or sensitive plant species in any areas to be disturbed could be impacted by any projects proposed.

Although relatively minor, the greatest overall change in vegetation types would result under Alternative B, followed by Alternatives A, D, E and C. In the long term ecological conditions would change under all alternatives, primarily through changes in grazing management. The greatest amount of change would occur under Alternative E, followed by Alternatives A, B, D and C, although predicted differences are relatively minor between them.

Riparian vegetation would show improvement under all alternatives, particularly under Alternatives A, D, and E. Under Alternative C, conditions would show little improvement as shown in Table 28.

Forest vegetation would continue to be impacted under all alternatives, primarily because of logging. Under intensive timber management, existing older forest communities scheduled for harvest would be converted to earlier successional stage communities containing a greater diversity of plant species, but to the exclusion of certain species associated with old growth communities. These impacts (changes away from climax conditions) would be greatest under Alternative B, followed by Alternatives C, D, A, and E. There would not, however, be significant differences in forest vegetative composition between alternatives, except in the long term for Alternative E, where there would be no intensive production base. Overall, plant diversity would be highest under Alternatives A and E, followed by Alternatives D, B and C, respectively.

Impacts to Wildlife

Upland Habitat

Wildlife forage and cover for upland habitats would increase under Alternatives A, B, D and E where grazing systems, decreased stocking rates, or exclusion of livestock use would be implemented. This would improve upland habitat diversity for big game and other wildlife species. Appendix G has an explanation of grazing systems. Most wildlife species would benefit in the long term under the grazing management proposed under Alternatives A, B, D and E. Short term changes would not be as significant. Crucial deer winter range would improve in allotments which would be intensively managed under Alternatives A, B, D and E, allowing for increased forage. Under Alternative C, spring/summer grazing would result in forage competition as described in Appendix G. Elk and antelope would also benefit under intensive grazing management implemented on crucial deer winter range.

Burning of sagebrush under Alternatives A, B, D, and E would temporarily reduce nesting and escape cover for non game species. It would, however, improve long billed curlew nesting habitat in the Horn Butte area over the long term. Spring developments proposed under Alternatives A, B, D, and E would temporarily reduce a small amount of

Mule deer near Stephenson Mountain

riparian vegetation but would eventually improve water availability and increase habitat diversity in some areas.

Forest practices—including road construction, logging operations, slash disposal and thinning—would have varying degrees of impact on wildlife habitat under Alternatives A, B, C and D. There would be no significant impact under Alternative E. The greatest effects on wildlife habitat and populations would result from changes in the height of vegetation, changes in species composition and an increased disturbance to wildlife. Road construction and logging operations would temporarily displace wildlife from areas while these activities were occurring. The effect would be the greatest under Alternative B. Wildlife species using areas adjacent to streams in forested areas would benefit the most under Alternatives A, D and E by maintenance of buffer strips of 75 feet to 200 feet on each side of the stream.

Mineral operations, exploration and development could affect wildlife populations in the short term under all alternatives. Significant adverse impacts could result under Alternative B from exploration activities for oil and gas. Impacts causing wildlife disturbance and displacements, especially with raptor species, and degradation of habitat could cause localized population shifts or losses. Impacts would not be significant under Alternatives A, C, D and E, because protective stipulations would be applied to exploration activities in sensitive areas. There would not be any long term impacts on wildlife.

An increase in public access into public lands in Zone 1 under Alternative B would be expected to increase levels of recreation use and consequently increase pressure and disturbance on some wildlife species, especially during crucial nesting periods and winter survival. Impacts under the other alternatives would not be significant.

Recreation activities would impact wildlife species where public lands are designated as "open" for off road vehicle (ORV) use. This would be particularly true under Alternative B. The adverse impact would be less under Alternatives A and C. Increased ORV use over time in areas open to ORV use would increase disturbance on wildlife species during crucial nesting and winter survival. Impacts to wildlife by ORV use would not be significant under Alternatives D and E.

Overall, upland habitat would improve and wildlife populations would increase under Alternatives A, D and E. Adverse impacts would occur to the upland habitat under Alternative B from forest practices, mineral operations, access acquisition, and open ORV use. No significant impacts would occur under Alternative C.

Riparian Habitat

Riparian habitat would benefit significantly under Alternatives A, D, and E, as a result of riparian fencing and exclusion of livestock grazing. Improved habitat condition and increased habitat diversity would result. This would increase populations of those wildlife species associated with the habitat (Table 15). Improvements in riparian habitat are expressed in change toward climax ecological condition. Alternatives A, D, and E would achieve this improvement through protective fence construction and grazing systems/season of use prescriptions. Fewer improvements in habitat condition would occur under Alternative B since less riparian fencing and fewer acres of livestock exclusion would occur. Habitat condition would remain essentially unchanged under Alternative C.

Impacts to riparian habitat would occur under Alternative B where new agricultural use would be authorized adjacent to streamside vegetation. Depending on the use authorization, populations of some wildlife species would increase while populations of other species would decline. No significant impact would occur under the other alternatives.

Overall, riparian habitat would improve significantly under Alternatives A, D and E. Alternative B would slightly improve riparian habitat condition. Habitat condition would remain unchanged under Alternative C.

Fish

Exclusion of livestock grazing through riparian fencing and development of instream projects would increase both anadromous and resident fish populations under Alternatives A, B, D, and E. Table 29 summarizes overall condition and trend of fish habitat as a result of implementing the alternatives. Streams most affected would include Fall Canyon, Buck Hollow, Wapinitia Creek, Trout Creek, Grass Valley Canyon, Ferry and Little Ferry Canyons, Jackknife Canyon, Pine Hollow, and Squaw Creek. Anadromous fish and resident trout would benefit from the projects proposed under the mentioned alternatives. Fish habitat would remain unchanged under Alternative C.

There are 13 miles of stream located within commercial forested land. Forestry practices would have localized short term adverse effects on fish habitat as a result of road construction, timber harvesting, and thinning. Impacts to aquatic habitat would have the potential of being the greatest under Alternative B due to the location of acres where forest products would be harvested. Fish habitat would also improve under Alternative B as a

result of riparian fencing and exclusion of livestock grazing in some areas. Table 30 and Appendix I summarize the acreage and practices that would be implemented under each alternative.

Overall, fish habitat would improve and populations would increase on all streams as a result of riparian fencing and exclusion of livestock under Alternatives A, D and E. Under Alternative B, fish habitat could be locally degraded in the short term because of forestry practices. The improvement in fish habitat elsewhere as a result of riparian fencing would outweigh those adverse impacts overall. No significant impacts would occur under Alternative C.

Impacts to Lifestock Grazing

Because of incomplete data for some allotments in the planning area it was necessary to make certain assumptions regarding existing and proposed grazing systems. These assumptions are described in Appendix G. Table 6 shows grazing systems by alternative. Appendix L shows proposed rangeland developments by allotment for Alternatives A and B.

Impacts to livestock grazing are expressed primarily as impacts to authorized forage utilization. Long term changes in forage available for livestock grazing are expected where grazing is allowed under all alternatives except Alternative C. This is due to changes in ecological condition through grazing management, sagebrush control and/or seeding. Appendix O discusses methodology and assumptions used to quantify existing and proposed grazing systems, and predicted ecological conditions.

The availability to livestock of any additional forage produced would be based on the resource objectives for each alternative. For purposes of analysis it was assumed that under Alternative A, up to 40 percent of any additional forage produced in the long term would be available to livestock except that no increases would be allowed in important wildlife areas or in areas with high visual quality. Under Alternative B, it was assumed that 100 percent of the increase would be available to livestock; and under Alternative D, that 25 percent of the increased forage in those areas where livestock grazing would occur, would be available to livestock.

Under Alternative C no change in authorized grazing use would occur in the long term.

As a result of actions proposed in this document, long term authorized grazing use is predicted to be 19,920 AUMs under Alternative A; 24,217 AUMs under Alternative B; 17,778 AUMs under Alternative C (no change); 13,834 AUMs under Alternative D and 0 AUMs under Alternative E. Appendix K shows initial and predicted long term livestock forage use by allotment.

Impacts to Forest Products

The differences in the approximate annual timber harvest under Alternatives A, B, C, and D are minor. In Alternative E, timber harvest would be reduced significantly and management of forestland would be custodial in nature. Table 30 shows, by alternative, how land use allocations for the protection of other resource values impact harvest levels.

Table 29 Stream Fish Habitat, Estimated Condition and Trend (Miles on Public Land)

	Existing Situation	Alt. A (Preferred)	Alt. B (Commodity Production)	Alt. C (Existing Management)	Alt. D (Natural Values w/ Commodities)	Alt. E (Natural Values)
Condition						
Excellent	71	108	91	71	167	167
MGood	16	55	35	16	43	43
Fair	104	83	90	104	37	37
Poor	56	1	31	56	0	0
Trend						
		Alt. A (Preferred)	Alt. B (Commodity Production)	Alt. C (Existing Management)	Alt. D (Natural Values w/ Commodities)	Alt. E (Natural Values)
Improving	13	100	70	13	247	247
Stable	221	147	177	221	0	0
Declining	13	0	0	13	0	0

Impacts to Energy and Minerals

Adverse impacts to exploration and development of oil and gas resources within the planning area would result from restrictive surface occupancy stipulations and the closure of lands to leasing. Substantial acreages of public land potentially valuable for oil and gas resources would be subject to restrictive lease stipulations under all alternatives. Opportunities to discover oil and gas deposits within the Deschutes and John Day river canyons would be severely restricted to further protect visual quality, wildlife habitat and other natural values. Alternatives D & E would involve a substantial increase in the area where surface occupancy is restricted to further protect visual quality, wildlife hapitat and other natural values. This would amount to 150,000 acres under Aldernative D and 200,000 acres under Alternative E. Alternatives A and C would not change the existing acreages subject to restrictive stiptulations. Alternative A would reduce the affect of no surface occupancy stipulations by setting criteria under which occupancy would be allowed within the river canyons. Alternative B would involve the smallest amount of area subject to limitations on surface occupancy with restrictions being removed from 72,000 acres. A comparison of public mineral acreages under the various leasing options is contained in Table 8 (Chapter 2).

Ponderosa Pine in Johnson Heights

Special management areas currently closed to leasing would remain closed under all alternatives. Approximately 3,000 acres would be unavailable for exploration and, hence, discovery of potential oil and gas resources. A comparison of the Minerals Potential Map (Map 9) with the Special Management Area Map (Map 13) shows that the majority of the acreage closed to leasing is located in areas not potentially valuable for oil and gas resources (The Cove Palisades State Park, 2,617 acres). Parts of the areas shown are, however, potentially valuable for geothermal resources. Closures of public land to mineral leasing would result in lost opportunities to discover and develop leasable mineral resources in an area where the mineral potential is unknown.

The public lands lie generally in two narrow corridors along the Deschutes and John Day river canyons and account for over 4 percent of the total planning area. These canyons represent a significant part of the Columbia Basin where the overlying basalt cap has been eroded away, thus aiding exploration of the subsurface resources. Restrictions placed on oil and gas leasing activities add to the increasing reliance of the United States on foreign sources of hydrocarbons by limiting the opportunities to discover and develop domestic resources.

Overall, impacts to mineral exploration and development would be greatest under Alternatives D and E, since additional areas would be closed to mineral leasing and a larger percentage of the public lands would be placed under restrictive surface occupancy stipulations. Alternatives A and C would maintain current restrictions and closures. Alternative B would slightly benefit mineral exploration and potential availability since restrictive stipulations would be removed from some areas. Overall impacts are not expected to be significant on a regional basis under any of the alternatives,

Table 30 Determination of Sustainable Harvest Level by Alternative

	Alternative				
	Alt. A (Preferred)	Alt. B (Commodity Production)	Alt. C (Existing Management)	Alt. D (Natural Values w/ Commodities)	Alt. E (Natural Values)
Acres Suitable for Timber Production[1]	11,010	11,010	11,010	11,010	11,010
Multiple Use Set Aside[2] (Equivalent Acres[3])					
Riparian	54	26	54	54	54
Wildlife Habitat	211	0	123	211	10,756
ACEC	30	0	0	0	200
Residual Intensive Production Base (acres)	10,715	10,984	10,833	10,745	0
Approximate Annual Harvest Million bd. ft.	1.41	1.45	1.43	1.42	.20

[1]From Table 20
[2]Acres suitable for timber production which would be withdrawn from the intensive timber production base to protect other resources.
[3]Not all acres have been specifically identified. It is assumed that mitigation measures to reduce site specific adverse effects would result in productivity losses equivalent to these acres as the need occurs.

but would be significant on a local basis. The availability of strategic and critical mineral resources would not be affected by any of the alternatives.

Impacts to Economic Conditions

The economically quantifiable resource outputs affected by the alternatives include livestock grazing, agricultural use and forest products. No significant impacts related to recreation activities have been identified for any alternative.

Economic impacts related to changes in livestock grazing are expressed in terms of operator dependence on public grazing land and changes in ranch property value.

Table 31 shows how lessee forage supplies would be affected by the alternatives. Shown are the number of operators in each herd size class falling within specified changes in forage supply.

Table 32 shows the number of operators with losses or gains in ranch value under each alternative.

Costs of implementing proposed range developments amount to approximately $54,600 under Alternative A, and $259,400 under Alternative B. Projects proposed to improve wildlife habitat under Alternative D would cost approximately $675,600 and the exclusion fence proposed under Alternative E would cost about $3,230,000. There are no developments proposed under Alternative C. Expenditures for materials and construction of these projects would generate income and employment in the seven county area. However, under no alternative would there be a significant increase in income or employment as a result of construction of these proposed projects.

Agricultural Lands

Of the 750 acres of public land currently used for agricultural purposes, approximately 100 acres of upland area and 200 acres of lowland area would cease to be cultivated under Alternatives A, C, and D. This would result in an decrease of approximately $31,000 in income above cash costs to the current farmers as summarized on Table 33. Under Alternative B, no land would be removed from agriculture production. Approximately 450 acres of upland area and 300 acres of lowland area would cease to be cultivated under Alternative E. This would result in a decrease of approximately $84,000 in income above cash costs to the current farmers.

Forest Products

Timber harvest from public lands is currently less than 1 percent of the total amount harvested in the planning area and is not a major contribution to income and employment for the seven county area.

The economic effects from changes in timber harvest would be minimal under Alternatives A, B,

Table 31 Number of Lessees Affected by Change in Public Forage*

Change in Forage as Percent of Annual Supply	Herd Size Group				Herd Size Group			
	Under 400	400-999	1000+	Total	Under 400	400-999	1000-+	Total
	Short Term				Long Term			
Alternative A (Preferred)								
Loss over 10.0%	-	-	-	-	-	-	-	-
Loss under 10.0%	-	-	4	3	-	-	3	
No change	160	26	12	198	132	14	7	153
Gain under 10.0%	7	2	-	9	35	14	5	54
Gain 10.0% to 19.9%	-	-	-	-	1	-	-	1
Gain 20.0% or more	-	-	-	-	-	-	-	-
Average Change	+1%	+1%		0	+1%	+1%	+1%	+1%
Alternative B (Commodity Production)								
Loss over 10.0%	-	-	-	-	-	-	-	-
Loss under 10.0%	4	-	-	4	2	-	-	2
No change	143	21	12	176	118	14	5	137
Gain under 10.0%	22	7	-	29	46	13	7	66
Gain 10.0% to 19.9%	2	-	-	2	5	1	-	6
Gain 20.0% or more	-	-	-	-	-	-	-	-
Average Change	+1%	+1%		0	+1%	+1%	+2%	+1%	+1%
Alternative C (Existing Management)								
Loss over 10.0%	-	-	-	-	-	-	-	-
Loss under 10.0%	4	-	-	4	4	-	-	4
No change	160	26	12	198	160	26	12	198
Gain under 10.0%	7	2	-	9	7	2	-	9
Gain 10.0% to 19.9%	-	-	-	-	-	-	-	-
Gain 20.0% or more	-	-	-	-	-	-	-	-
Average Change	+1%	+1%		0	+1%	+1%	+1%	0	+1%
Alternative D (Natural Values w/Commodities)								
Loss over 10.0%	10	-	-	10	10	-	-	10
Loss under 10.0%	43	18	5	66	41	12	5	58
No change	111	9	7	127	106	10	4	120
Gain under 10.0%	7	1	-	8	14	6	3	23
Gain 10.0% to 19.9%	-	-	-	-	-	-	-	-
Gain 20.0% or more	-	-	-	-	-	-	-	-
Average Change	-1%	-1%	-1%	-1%	-1%	-1%	-1%	-1%
Alternative E (Natural Values)								
Loss over 10.0%	25	1	-	26	25	1	-	26
Loss under 10.0%	146	27	12	185	146	27	12	185
No change	-	-	-	-	-	-	-	-
Gain under 10.0%	-	-	-	-	-	-	-	-
Gain 10.0% to 19.9%	-	-	-	-	-	-	-	-
Gain 20.0% or more	-	-	-	-	-	-	-	-
Average Change	-4%	-3%	-1%	-3%	-4%	-3%	-1%	-3%

*Change from scheduled active use.

and D. There would be no change in timber harvest under Alternative C.

A decline of 1.23 MMbf under Alternative E could cause a slight decline in income and employment.

Overall, there would be no significant impact to the local economy as a result of changes in harvest levels from public lands in the planning area under any alternative.

Chukar hunter in the Deschutes River Canyon

Table 32 Number of Lessees with Loss or Gain in Ranch Value*

	Herd Size Group				Herd Size Group			
	Under 400	400-999	1000+	Total	Under 400	400-999	1000+	Total
	Short Term				Long Term			
Alternative A (Preferred)								
Lessees with Losses	-	-	-	-	-	-	-	-
Total Losses ($)	-	-	-	-	-	-	-	-
Lessees with Gain	-	-	-	-	30	14	5	49
Total Gains ($)	-	-	-	-	+62,000	+54,000	+12,000	+128,000
Net Change ($)	-	-	-	-	+62,000	+54,000	+12,000	+128,000
Alternative B (Commodity Production)								
Lessees with Losses	-	-	-	-	-	-	-	-
Total Losses ($)	-	-	-	-	-	-	-	-
Lessees with Gain	18	5	-	23	45	14	7	66
Total Gains ($)	+52,000	+33,000	-	+85,000	+170,000	+177,000	+38,000	+385,000
Net Change ($)	+52,000	+33,000	-	+85,000	+170,000	+177,000	+38,000	+385,000
Alternative C (Existing Management)								
Lessees with Losses	-	-	-	-	-	-	-	-
Total Losses ($)	-	-	-	-	-	-	-	-
Total Gains ($)	-	-	-	-	-	-	-	-
Net Change ($)	-	-	-	-	-	-	-	-
Alternative D (Natural Values /w Commodities)								
Lessees with Losses	52	19	5	76	51	13	5	69
Total Losses ($)	-191,000	-86,000	-36,000	-313,000	-185,000	-61,000	-32,000	-278,000
Lessees with Gain	1	-	-	1	8	7	3	18
Total Gains ($)	+8,000	-	-	+8,000	+22,000	+15,000	+4,000	+41,000
Net Change ($)	-183,000	- 86,000	- 6,000	-305,000	-163,000	-46,000	-28,000	-237,000
Alternative E (Natural Values)								
Lessees with Losses	171	28	12	211	171	28	12	211
Total Losses ($)	-574,000	-322,000	-170,000	-1,066,000	-574,000	-322,000	-170,000	-1,066,000
Lessees with Gain	-	-	-	-	-	-	-	-
Total Gains ($)	-	-	-	-	-	-	-	-
Net Change ($)	-574,000	-322,000	-170,000	-1,066,000	-574,000	-322,000	-170,000	-1,066,000

*Change calculated at $60 per AUM active preference. No changes in ranch value would occur under Alternative A in the short term, and under Alternative C no change would occur in the short or long term.

Table 33 Agricultural Income on Public Lands

	Acres Reclaimed		
	Total	Upland	Lowland
Alt. A	300	100	200
Alt. B	0	0	0
Alt. C	300	100	200
Alt. D	300	100	200
Alt. E	750	450	300

	Net Income Lost		
	Upland $125.94/Ac	Lowland $89.64/Ac	Total
Alt. A	$12,594	$17,928	$30,522
Alt. B	0	0	0
Alt. C	$12,594	$17,928	$30,522
Alt. D	$12,594	$17,928	$30,522
Alt. E	$56,673	$26,892	$83,565

Under most alternatives there are offsetting factors minimizing the economic impacts to the seven county area. For example, under Alternative A, there are slight losses in forage, timber harvest, and losses in income from farming on public land, which would have a slight effect on local personal income and employment. There are also projects proposed under this alternative which would generate local personal income and employment and could partially offset the losses. The exception is Alternative B, which has slight increases in forage allocations and projects proposed, both of which would have positive effects on the local economy. Livestock operators would experience losses in forage and loss of ranch value under Alternatives D and E. All livestock operators would be affected under Alternative E from loss of forage allocation.

Impacts to Recreation

As shown on Table 34, none of the alternatives is expected to significantly change long term recreation use levels. Fencing would occur under Alternatives A, B, D and E and would enhance recreation opportunities to a limited degree by excluding livestock from riparian areas. Wildlife habitat would be enhanced, increasing the number and diversity of wildlife available for sightseeing, photography and hunting purposes. Fences could, however, limit public use by restricting movement through the areas where fences would be constructed.

Recreation opportunities in riparian areas adjacent to the Deschutes and John Day rivers would be greatest under Alternatives A, D and E, due to livestock exclusion and wildlife habitat improvement. Improvement would also occur under Alternative B. No significant impacts to recreation opportunities would result under Alternative C.

Recreation opportunities would be improved by acquisition of additional public access under Alternative B. Smaller increases under Alternatives A, D, and C would also occur. Recreation opportunities would remain relatively constant under Alternative E, since no additional public access would be acquired.

Rockhounding

Under Alternative B rockhounding opportunities would increase slightly over the long term because public lands would be more available for collecting, except where significant conflicts with natural values occur.

Alternatives E and D would have adverse impacts to rockhounding because of the potential restriction on the use of off road vehicles for access to collecting areas. Use levels would increase slightly in those collecting areas where the acquisition of additional public access occurred. Overall, rockhounding opportunities would increase under Alternative B; would not be significantly impacted under Alternatives A or C; and would decrease under Alternatives E and D.

Table 34 Predicted Long Term Changes in Recreation Visitor Use

Estimated Visitor Use (other than recreation river use)	Alt. A (Preferred)	Alt. B (Commodity Production)	Alt. C (Existing Management)	Alt. D (Natural Values w/Commodities)	Alt. E (Natural Values)
62,000 Visitor Days	+L	+L	N/C	+L	+L

\+ Use levels would increase
L Low
N/C No Change from Current Levels

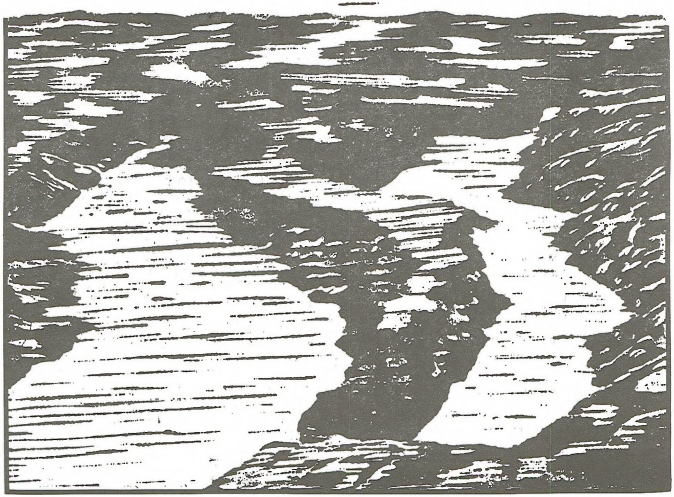
Off Road Vehicle Use

No significant impacts to off road vehicle (ORV) use would occur under Alternatives A, B, or C. However, ORV use would be adversely affected by restrictions or exclusion on 150,000 acres under Alternative D and 200,000 acres under Alternative E.

The greatest overall benefits to all recreationists would occur under Alternatives B, A, C, D and E, respectively. Although Alternatives E and D provide the greatest improvement of recreation opportunities in riparian areas, they adversely affect recreation opportunities for hunting and rockhounding in other areas, due to off road vehicle restrictions.

Impacts to Cultural Resources

In accordance with the National Historic Preservation Act of 1966, as amended, Executive Order 11593 and BLM policy, appropriate measures would be taken to identify and protect cultural sites before ground disturbing activities occur. These regulations, policies and legislation apply to all cultural sites and are the same under all alternatives. As a result of this guidance, the effects of activities that would normally reduce cultural resource values would be mitigated. Livestock grazing affects cultural resources through trampling. Riparian fencing under Alternatives A, B and D would reduce trampling of artifacts byexcluding livestock from many of the areas (adjacent to rivers and streams) where cultural sites are known to exist. No trampling would occur under Alternative E due to the complete exclusion of livestock from the public lands. There would be no change under Alternative C.



Impacts to Visual Resources

Short term impacts to areas of high visual quality in the John Day and Deschutes river canyons would result from rangeland developments and riparian/wildlife projects (primarily fences). These impacts would be the greatest under Alternatives B, A, D, E and C, in that order. Restricting or eliminating grazing within many of the areas would improve long term visual quality. This improvement would be the greatest under Alternatives E, D, A, and B in that order. This would occur as a result of improved vegetation condition and increased plant diversity. Under Alternative C overall condition would remain unchanged.

Areas subject to stipulations to protect visual quality from mineral exploration vary from 60,000 acres under Alternative B (least amount of restriction), to 200,000 acres under Alternative E (greatest amount of restriction). Alternatives A, C, and D would generally maintain existing visual quality.

Visual quality would receive the greatest amount of protection from disturbance by off road vehicles under Alternatives E, D, A, C and B, respectively. This would occur as a result of restriction or complete elimination of off road vehicle use in sensitive areas.

Overall visual quality would be improved most under Alternatives E, D, and A, respectively. This would result from improved vegetative condition and increased plant diversity. Although scenic quality would be slightly reduced in some areas by fence construction, long term impacts would not be significant with proper location, color and screening by vegetation and topography. Off road vehicle restrictions would also protect or improve visual quality by restricting or eliminating use in areas containing high visual quality. Visual quality would be adversely affected under Alternative B due to rangeland developments and mineral exploration. There would be no significant change under Alternative C.

Impacts to Special Management Areas

Impacts to special or unique resource values in the 13 identified Special Management Areas vary by alternative, as described in Table 35. Alternatives

Table 35 Impacts to Special or Unique Resource Values by Alternative[1]

Special Management Area	Alt. A (Preferred	Alt. B (Commodity Production)	Alt. C (Existing Management)	Alt. D (Natural Values w/Commodities)	Alt. E (Natural Values)
The Island in The Cove Palisades State Park	N/C	N/C	N/C	N/C	N/C
John Day River Canyon, including the Red Wall	N/C	-L	-L	N/C	N/C
Deschutes River Canyon	N/C	-L	-L	N/C	N/C
John Day River State Wildlife Refuge	+M	+M	-L	+M	+M
Horn Butte Wildlife Area	+M	N/C	N/C	+L	+L
White River Wildlife Management Area	N/C	N/C	N/C	N/C	N/C
The Dalles Watershed Area	N/C	N/C	N/C	N/C	N/C
Governor Tom McCall Preserve at Rowena	N/C	N/C	N/C	N/C	N/C
Fourmile Canyon Historic Site	N/C	N/C	N/C	N/C	N/C
McDonald Crossing Historic Site	N/C	N/C	N/C	N/C	N/C
Historic Spanish Gulch Mining District	N/C	N/C	N/C	N/C	N/C
Macks Canyon Archaeological Site	N/C	N/C	N/C	N/C	N/C
Botanical/Scenic Areas within the Columbia Gorge	N/C	N/C	N/C	N/C	N/C
Overall Impact	+L	-L	-L	+L	+L

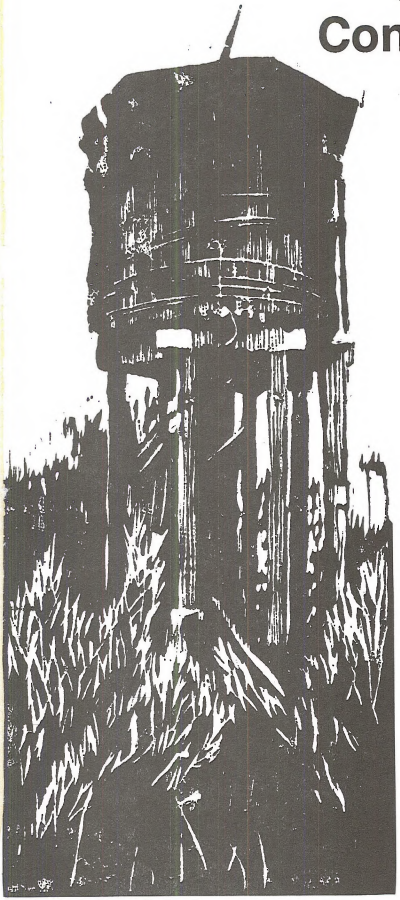
[1]Impacts of livestock grazing, wildlife habitat and riparian management as well as forestry, recreation and minerals exploration and development were evaluated jointly to receive an overall rating.

+ Enhanced
- Degraded
M Moderate
L Low
N/C No change

A, D and E would protect and preserve the unique values of these areas by designation as ACECs, RNAs, or ONAs. Under Alternative B, the acreage under protective stipulation would decrease by 72,000 acres. If oil and gas exploration in the Deschutes and John Day canyons were to occur, surface disturbance that could result would impact the unique or special resource values of the Deschutes and John Day river canyons. These areas are now protected by a no surface occupancy stipulation.

Alternatives A, D and E would provide the most comprehensive resource protection for all special management areas. Alternatives B and C would have adverse overall impacts to the resource values of these areas.

Chapter 5
Consultation and Distribution



Old railroad water tower at Harrison Canyon

Consultation & Distribution

The Two Rivers RMP/EIS was prepared by an interdisciplinary team of specialists from the Prineville BLM District Office. Writing of the RMP/EIS began in October, 1984; however, a complex process that began in March 1984 preceded the writing phase. The RMP/EIS process included resource inventory, public participation, interagency coordination, and preparation of a management situation analysis (on file at the Prineville District Office). Consultation and coordination with agencies, organizations, and individuals occurred throughout the planning process.

Public Involvement

A notice was published in the Federal Register and local news media in April 1984 to announce the formal start of the RMP/EIS planning process. At that time a planning brochure was sent to the public to request further definition of issues within the planning area. An opportunity was provided to submit comments on proposed criteria to be used in formulating alternatives.

In May 1984 a notice of document availability was published in the Federal Register and in the local news media for the Two Rivers Resource Management Plan Proposed Land Use Alternatives brochure. An outline of proposed alternatives, major issues, and revised planning criteria were included in this document. Three alternatives portrayed various resource programs showing a range from emphasis on production of commodities to an emphasis on enhancement of natural values with a middle ground alternative attempting to provide a balance between the two. The fourth (no action) alternative reflects existing management. The proposed alternatives brochure included a map on allotment categorization for grazing management and another map which divided the public lands into three different zones. Neither map generated any comment or public objections during the EIS scoping process.

Agencies and Organizations Contacted or Consulted

The RMP/EIS team contacted or received input from the following organizations during the development of the RMP/EIS.

Federal Agencies

U.S.D.E. Bonneville Power Administration
U.S.D.I. Bureau of Mines
U.S. Environmental Protection Agency
U.S.D.I. Fish and Wildlife Service
U.S.D.A. Forest Service
U.S.D.I. National Park Service
U.S.D.A. Soil Conservation Service

State and Local Governments

Fish and Wildlife Department
Department of Forestry
Department of Lands
Historic Preservation Officer
Department of Geology and Mineral Industries
Oregon State Parks and Recreation Division of the
Department of Transportation
Department of Water Resources

Crook County Commissioners
Gilliam County Commissioners
Hood River County Commissioners
Jefferson County Commissioners
Sherman County Commissioners
Wasco County Commissioners
Wheeler County Commissioners

Organizations

Atlantic Richfield Company
Brooks Resources Corporation
Central Oregon Audubon Chapter
Central Oregon Flyfishers
Environmental Research Committee
Meridian Land and Mineral Company
Natural Resources Defense Council, Inc.
Oregon Council of Rock and Mineral Clubs
Oregon Hunters Association
Oregon Natural Heritage Data Base
Southern California Edison Company
University of Oregon/Land Air Water/An
Independent Law Student
Western Utility Group

List of Agencies, Persons and Organizations to Whom Copies of the RMP/EIS Have Been Sent.

Federal Agencies

Advisory Council on Historic Preservation
U.S. Environmental Protection Agency
U.S.D.A. Forest Service
U.S.D.A. Soil Conservation Service
U.S.D.D. Army Corps of Engineers
U.S.D.E. Bonneville Power Administration
U.S.D.I. Bureau of Indian Affairs
U.S.D.I. Fish and Wildlife Service
U.S.D.I. Geological Survey
U.S.D.I. National Park Service
U.S.D.I. Bureau of Mines
U.S.D.I. Bureau of Reclamation
U.S.D.C. National Marine Fisheries Service

State and Local Government

Crook County Court
Crook County Planning Commission
Central Oregon Intergovernmental Council
East Central Oregon Association of Counties
Gilliam County Court
Gilliam County Planning Department
Hood River County Planning Department
Jefferson County Commissioners
Jefferson County Planning Department
Oregon State University Extension Service
Department of Environmental Quality
Department of Fish and Wildlife
Department of Geology and Mineral Industries
Division of State Lands
Department of Land Conservation and Development
Department of Forestry Parks and Recreation
Division of the Department of Transportation
Department of Agriculture
Historic Preservation Officer
Clearinghouse, Executive Department A-95
Intergovernmental Relations Division
State Library National Association of Conservation
Districts Sherman County Court Sherman County
Planning Department Warm Springs Tribal
Commission Wasco County Planning Department
Wheeler County Planning Department

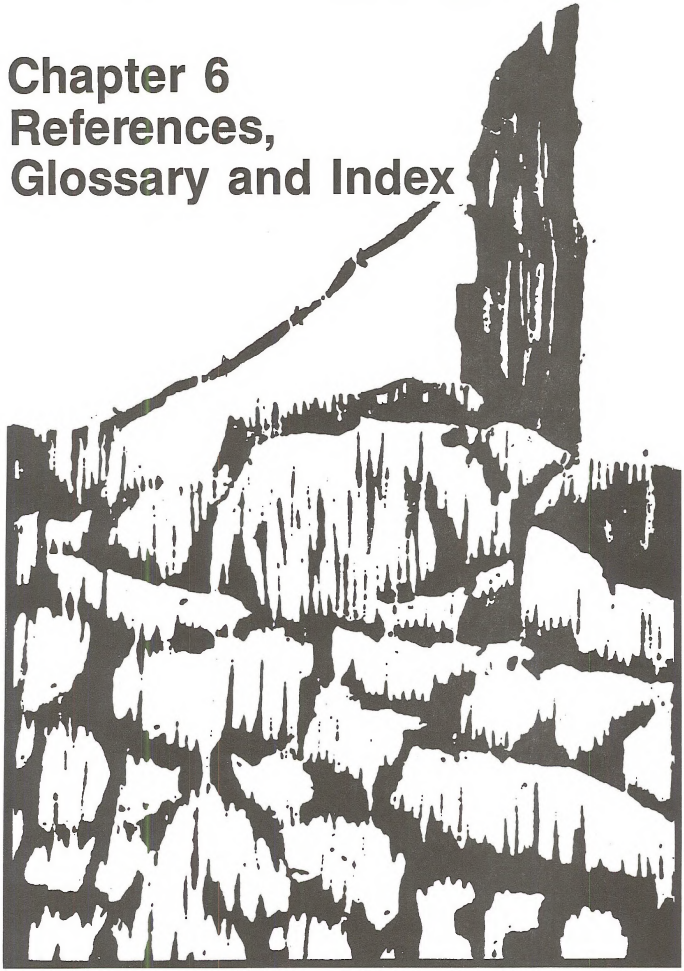
Interest Groups and Organizations

1000 Friends of Oregon
American Fisheries Society
American Forest Institute
AMOCO Production Company
Associated Oregon Industries
Associated Oregon Loggers Inc.
Association of Oregon Archaeologists
Atlantic Richfield Company
Audubon Society
Bohemia Mine Owners Association
Brooks Resources Corporation
Cascade Holistic Economic Consultants
Chevron Resources Company
Columbia River Intertribal Fish Commission
Columbia Gorge Coalition
Confederated Tribes of Warm Springs
Defenders of Wildlife
Desert Trail Association
East Cascade Action Committee
East Oregon Forest Protective Association
Eastern Oregon Mining Association
Environmental Education Association of Oregon
Federation of Western Outdoors Clubs
Friends of the Earth
Geothermal Resources Council
Industrial Forestry Association
Izaak Walton League
League of Women Voters
Mazamas
National Mustang Association
National Public Lands Task Force
Natural Resources Defense Council
National Wildlife Federation
Native Plant Society of Oregon
Nature Conservancy
Northwest Environmental Defense Center
Northwest Federation of Mineralogical Science
Northwest Mineral Prospectors Club
Northwest Mining Association
Northwest Petroleum Association
Northwest Pine Association
Northwest Power Planning Council
Northwest Timber Association
Oregon Cattleman's Association
Oregon Council of Rock and Mineral Clubs
Oregon Environmental Council
Oregon Hunter's Association
Oregon Natural Heritage Data Base
Oregon Natural Resources Council
Oregon Sheep Growers
Oregon Sportsman and Conservationist
Oregon Trout
Oregon Wilderness Coalition
Oregon Wildlife Federation
Pacific Gas Transmission Company

PNW Research Natural Area Forestry Science Lab
Pacific NW 4 Wheel Drive Association
Pacific NW Forest and Range Experiment Station
Public Lands Council
Public Lands Institute
Rocky Mountain Realty, Inc.
Sagecountry Alliance for a Good Environment
Shell Western F&P Inc.
Sierra Club
Society for Range Management
The Oregon Group
The Wilderness Society
The Wildlife Society
Waldo Mining District Association
Western Council; Lumber, Production and Industrial Workers
Western Forest Industries Association
Western Land Exchange
Western Oil and Gas Association
Wildlife Management Institute

Approximately 467 additional individuals and organizations who have expressed an interest in use and management of public lands in the planning area were also sent copies of the RMP/EIS. Included in this group are all grazing lessees within the planning area, members of the State legislature, U.S. Congressional delegation, and various educational institutions.

Chapter 6
References, Glossary and Index



Old rock corral in Ferry Canyon

List of Preparers

Although individuals have primary responsibility for preparing sections of an environmental impact statement or a resource management plan, the document itself is an interdisciplinary team effort. An internal review of the document was conducted at each stage of its preparation. Specialists at the district level and the state level of the Bureau of Land Management reviewed the analysis and supplied information. Contributions by individuals in the preparation of the document may be subject to revision by other BLM specialists and by management staff members during the internal review process.

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Brian Cunninghame	Team Leader	Public Information Officer	Supervisory Natural Resource Specialist, Outdoor Recreation Planner, BLM 18 years
Tanya Graves	Word Processing	Receptionist	FmHA, BLM 2 years
Ron Halvorson	Livestock Grazing, Vegetation	Range Management	Range Conservationist, BLM 11 years
Mike Henderson	Riparian, Fisheries, Wildlife	Wildlife Biology	Wildlife Biologist BLM, 8 years
Rosalie McFarland	Word Processing	Receptionist	Army, Navy, Air Force, OSD, BLM, 20 years
Berry Phelps	Special Management Areas, Recreation, Visual Quality	Recreation, Wilderness	Outdoor Recreation Planner, Wilderness Specialist, Natural Resource Specialist, BLM, 8 years
Robert Shotwell	Writer, Editor	Writing, Editing	Freelance writer, editor, newspapers, magazines
Larry Thomas	Climate, Air, Soils, Water	Soil Science, Biology, Watershed/ Hydrology	Soil Scientist, 1 year, USDA, BIA; Soil Scientist, Watershed Specialist BLM, 8 years
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Gary Thrash	Lands, Minerals	Lands and Realty Specialist	Realty Specialist, BLM, 7 years
Syd Williamson	Forest Products	Forestry	Forester, BLM, 8 years

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Glossary of Terms

Actual Use -- The true amount of grazing AUMs based on the numbers of livestock and grazing dates submitted by the livestock operator and confirmed through periodic field checks by BLM personnel.

Adjustments -- Changes in animal numbers, periods of use, kinds or class of animals or management practices as warranted by specific conditions.

Allotment -- An area of land where one or more livestock operators graze their livestock. Allotments generally consist of public lands administered by the BLM, but may include other federally managed, state owned or private lands. An allotment may include one or more separate pastures. Livestock numbers and periods of use are specified for each allotment where BLM controls use.

Allotment Management Plan (AMP) -- A written program of livestock grazing management, including supportive measures, if required, designed to attain specific management goals in a grazing allotment.

Alluvial Soil -- A soil developing from recently deposited alluvium and showing essentially no development of layers or modification of the recently deposited materials.

Anadromous -- Fish that migrate from the ocean to breed and spawn in fresh water. Their offspring return to the ocean.

Animal Unit Month (AUM) -- A standardized measurement of the amount of forage necessary for the sustenance of one cow equivalent unit for one month.

Aquatic -- Living or growing in or on the water.

Archaeological Site -- Geographic locale containing structures, artifacts, material remains, and/or other evidence of past human activity.

Areas of Critical Environmental Concern (ACEC) -- Places within public lands where special management attention is required (when such areas are developed or where no development is required) to protect and prevent irreparable damage to important historical, cultural or visual values, fish and wildlife resources, or other natural systems or processes, or to protect life and safety from natural hazards.

Big Game Animals -- Limited to elk, mule deer, antelope and bighorn sheep in the Two Rivers Planning Area.

Board Foot -- A unit of solid wood, one foot square and one inch thick.

Broadcast Burning -- Allowing a controlled fire to burn over a designated area with well defined boundaries for a reduction of fuel hazard or as a silvicultural treatment, or both.

Buffer Strip -- A protective area adjacent to an area of concern requiring special attention or protection. In contrast to riparian zones which are ecological units, buffer strips can be designed to meet varying management concerns.

Clearcutting -- A method of harvesting timber in which all trees, merchantable or unmerchantable, are cut from an area.

Climax -- The final or stable biotic community in a successional series. It is usually self perpetuating and in equilibrium with the other habitat. This corresponds to 76 to 100 percent of the plant composition found in the potential natural plant community. It could be considered synonymous with excellent range condition.

Commercial Forestland -- Forest land that is now producing, or is capable of producing, at least 20 cubic feet of wood per acre per year of commercial tree species.

Commercial Tree Species -- Tree species whose yields are reflected in the annual timber sale program: pines, firs, spruce, Douglas fir, cedar, and larch.

Compaction -- The process of packing firmly and closely together; the state of being so packed, (e.g., mechanical compaction of soil by livestock or vehicular activity). Soil compaction results from particles being pressed together so that the volume of soil is reduced. It is influenced by the physical properties of the soil, moisture content and the type and amount of compactive effort.

Commodity Resources -- Goods or products of economic use or value.

Crucial Wildlife Habitat -- Parts of the habitat needed to sustain a wildlife population at critical periods of its life cycle. This is often a limiting factor on populations, such as breeding habitat, winter habitat, etc.

Cultural Resources -- Fragile and nonrenewable elements of the environment including archaeological remains (evidence of prehistoric or historic human activities) and sociocultural values traditionally held by ethnic groups (sacred places, traditionally utilized raw materials, etc.).

Cultural Site -- Any location that includes prehistoric and/or historic evidence of human use, or that has important sociocultural value.

Deferment -- The withholding of livestock grazing until a certain stage of plant growth has been reached, usually until seeds have matured and food has been stored in the roots.

Deferred Rotation Grazing -- Discontinuance of livestock grazing on various parts of a range in succeeding years, allowing each part to rest successively during the growing season. This permits seed production, establishment of new seedlings or restoration of plant vigor. Two, but more commonly three or more, separate pastures are required.

Distribution -- The uniformity of livestock grazing over a range area. Distribution is affected by the availability of water, topography and type and palatability of vegetation, as well as many other factors.

Diversity -- A measure of the variety of species and habitats in an area that takes into account the relative abundance of each species or habitat.

Early Seral -- Ecological condition class that corresponds to 0 to 25 percent of the plant composition found in the potential natural plant community. It could be considered synonymous with poor range condition.

Ecological Condition Classes -- Four classes used to express the degree to which the composition of the present plant community reflects that of climax. They are:

Range Condition (Successional Stage)	Percentage of Present Plant Community That is Climax for the Range Site
Climax	76--100
Late Seral	51--75
Middle Seral	26--50
Early Seral	0--25

Endangered Species -- A plant or animal species whose prospects for survival or reproduction are in immediate danger as designated by the Secretary of the Interior and as further defined by the Endangered Species Act of 1973, as amended.

Environmental Impact Statement (EIS) -- A formal document to be filed with the Environmental Protection Agency that considers significant environmental impacts expected from implementation of federal actions.

Erosion -- Detachment and movement of soil or rock fragments by water, wind, ice or gravity.

Exclosure -- An area fenced to exclude livestock.

Forage -- All browse and herbaceous plants that are available to grazing animals, including wildlife and domestic livestock.

Federal Land Policy and Management Act of 1976 (FLPMA) -- Public Law 94--579 of October 21, 1976, often referred to as the BLM 'Organic Act,' which provides the majority of BLM legislated authority, direction, policy and basic guidance for management.

Forb -- A broad leafed herb that is not grass, sedge or rush.

Forestland -- Land which is now, or is capable of being, at least 10 percent stocked by forest trees, and is not currently developed for nontimber use.

Grazing System -- The manipulation of livestock grazing to accomplish a desired result.

Groundwater -- Subsurface water that is in the zone of saturation.

Habitat -- A specific set of physical conditions that surround a species group of species, or a large community. In wildlife management, the major constituents of habitat are considered to be food, water, cover and living space.

Habitat Diversity -- The relative degree or abundance of plant species, communities, habitats or habitat features (e.g. topography, canopy layers) per unit of area.

Habitat Management Plan -- A plan for the management of wildlife habitat.

Habitat Type -- The collective area which one plant association occupies or will come to occupy as succession advances. The habitat type is defined and described on the basis of the vegetation and associated environment.

Infiltration -- The gradual downward flow of water from the surface into the soil profile.

Issue -- A subject or question of widespread public discussion or interest regarding management of public lands within the Prineville District and identified through public participation.

Impact -- A spatial or temporal change in the human environment caused by man. The change should be (1) perceptible, (2) measurable, and (3) relatable through a change agent to a management activity or alternative.

Land Treatment -- All methods of range development and soil stabilization such as reseeding, sagebrush control (burning and mechanical), pitting, furrowing, water spreading, etc.

Late Seral -- Ecological condition class corresponding to 51 to 75 percent of the plant composition found in the potential natural plant community. Synonymous with good range condition.

Leasable Minerals -- Minerals subject to lease by the federal government, including oil, gas and coal.

Life Form -- A group of wildlife species whose requirements for habitat are satisfied by similar successional stages within a given plant communities.

Litter -- A surface layer of loose, organic debris, consisting of freshly fallen or slightly decomposed organic materials.

Livestock Operation -- A ranch or farm where a significant portion of the income is derived from the continuing production of livestock.

Locatable Minerals -- Generally the metallic minerals subject to development specified in the General Mining Law of 1872; with the resource area, includes bentonite gypsum, uranium minerals, etc.

Lopping and Scattering -- Cutting limbs from the bole of a tree and spreading them evenly over the ground, without burning.

Management Situation Analysis (MSA) -- A comprehensive display of physical resource data and an analysis of the current use, production, condition and trend of the resources and the potentials and opportunities within a planning unit, including a profile of ecological values.

Mid Seral -- Ecological condition class that corresponds to 26 to 50 percent of the composition found in the potential natural plant community. It could be considered synonymous with fair range condition.

Mitigation Measures -- Methods or procedures committed to by BLM for the purpose of reducing or lessening the impacts of an action.

National Register of Historic Places (NRHP) -- A register of districts, sites, buildings, structures, and objects, significant in American history, architecture, archaeology, and culture, established by the Historic Preservation Act of 1966 and maintained by the Secretary of the Interior.

Noncommercial Forestland -- Forestland which is not capable of producing at least 20 cubic feet of wood per acre per year of commercial tree species.

Noncommercial Tree Species -- Species whose yields are not reflected in the allowable cut, regardless of their salability. Includes all hardwoods, juniper and Mountain mahogany.

Nonoperable -- Forestland that is unsuitable for timber harvest because:
1) Its physical isolation or the severity of the topography makes it extremely difficult or impossible to manage for sustained yield timber productions,
2) Soil erosion from harvesting activities would easily reduce or destroy the potential for producing timber, or;
3) Severe reforestation problems would prevent establishment of commercial tree species in accepted numbers and within acceptable time limits (usually five to 15 years).

Noxious Weeds -- A weed specified by law as being especially undesirable, troublesome and difficult to control.

Off Road Vehicle (ORV) -- Any motorized vehicle capable of, or designed, for travel on or immediately over land, water, or other natural terrain, excluding: (1) any nonamphibious registered motorboat; (2) emergency vehicles; and (3) vehicles in official use.

Operations Inventory -- An intensive forest inventory which provides managers with information on the location, acreage, silvicultural needs, and mortality salvage or thinning needs within each section of public land.

Perennial (Permanent) Stream -- A stream that ordinarily has running water on a year round basis.

Period of Use -- The time of livestock grazing on a range area based on the type of vegetation or stage of vegetative growth.

Permit/Leases (Grazing) -- Under Section 3 of the Taylor Grazing Act, a permit is a document authorizing use of public lands within grazing districts for the purpose of grazing livestock.

Under Section 15 of the Taylor Grazing Act, a lease is a document authorizing livestock grazing use of public lands outside grazing districts.

Planning Area -- A geographic area within the Prineville BLM District used for assembling resource inventory data.

Prehistoric -- Refers to a period wherein Native American cultural activities took place which were not yet influenced by contact with historic non native culture(s).

Prescribed Fire -- A planned burning of live or dead vegetation under favorable conditions which would achieve desired management objectives.

Protective Ground Cover -- See watershed cover.

Public Lands -- Any land and interest in land owned by the United States Government and administered by the Secretary of the Interior through the Bureau of Land Management. It may include public domain or acquired lands in any combination.

Range Development -- A structure, excavation, treatment or development to rehabilitate, protect or improve public lands to advance range betterment.

Range Seeding -- The process of establishing vegetation by the mechanical dissemination of seed.

Range Trend -- The direction of change in range condition and soil.

Raptors -- Bird species with sharp talons and strongly curved beaks which have adapted to seize prey (e.g. eagles, hawks, etc.)

Recreation and Public Purposes Act (R&PP Act) -- This act authorizes the Secretary of the Interior to lease or convey public lands for recreational and public purposes under specified conditions to states or their political subdivisions, and to nonprofit corporations and associations.

Research Natural Areas -- Areas established and maintained for research and education. The general public may be excluded or restricted where necessary to protect studies or preserve research natural areas. Lands may have (1) typical or unusual faunistic or floristic types, associations, or other biotic phenomena, or (2) characteristic or outstanding geologic, pedologic, or aquatic features or processes.

Reserved Federal Mineral Estate -- Property on which the federal government has retained ownership of minerals (and the right to remove the minerals) while transferring the surface estate into private or other ownership.

Residual Ground Cover -- That portion of the total vegetative ground cover that remains after livestock grazing.

Restricted Forestland -- Problem sites in the timber base on which special techniques are required to protect the timber growing potential or to insure adequate regeneration within a specified time, which is usually five years.

Right of Way -- A permit or an easement which authorizes the use of public lands for certain specified purposes, commonly for pipelines, roads, telephone lines, electric lines, reservoirs, etc., and also the lands covered by such an easement or permit.

Riparian Area -- A terrestrial site influenced by perennial and intermittent waters which in combination with the water table level, soils and vegetation create a microclimate apart from that which exists on the upland terrestrial sites. These areas are found adjacent to rivers, streams, lakes, reservoirs, ponds, marshes, seeps, springs, bogs and wet meadows.

Runoff -- That portion of the precipitation on a drainage area that is discharged from the area in stream channels, including both surface and subsurface flow.

Sediment -- Soil, rock particles and organic or other debris carried from one place to another by wind, water or gravity.

Sensitive Species -- Plant or animal species not yet officially listed, but which are undergoing a status review or are proposed for listing according to a Federal Register notice published by the Secretary of the Interior or the Secretary of Commerce, or according to comparable state documents published by state officials.

Seral Stage -- The series of relatively transitory communities, including plants and animals, which develop during ecological succession, beginning after the Pioneer Stage (beginning with bare ground) to the Climax Stage.

Shrub -- A low, woody plant, usually with several stems, that may provide food and/or cover for animals.

Slash -- The branches, bark, tops, cull logs, and broken or uprooted trees left on the ground after logging has been completed.

Soil -- The unconsolidated mineral material on the immediate surface of the earth that serves as a natural medium for the growth of land plants.

Soil Moisture -- Water held in the root zone by capillary action. Part of the soil moisture is available to plants, part is held too tightly by capillary or molecular forces to be removed by plants.

Soil Productivity -- Capacity of a soil, in its normal environment, for producing specified plants under specified management systems.

Special Management Areas -- See Areas of Critical Environmental Concern (ACEC) and Research Natural Areas (RNA).

Stocked, 10 percent -- Tree seedlings and saplings (0.5 inches in diameter 4.5 feet above the ground) that are well distributed over the land and are more than 30 per acre in number. Or, they are trees larger than 5 inches in diameter with foliage that covers at least 10 percent of the land surface area.

Sustainable Annual Harvest -- The yield a forest can produce continuously from a given level of management.

Thermal Cover -- Vegetation or topography that prevents radiational heat loss, reduces wind chill during cold weather and intercepts solar radiation during warm weather.

Threatened Species -- A plant or animal species the Secretary of Interior has determined to be endangered in the foreseeable future throughout all or most of its range.

Timber Production Capability Classification (TPCC) -- The process of partitioning forestland into major classes indicating relative suitability to produce timber on a sustained yield basis.

Upland -- All rangelands other than riparian or wetland areas.

Vegetative (Ground) Cover -- The percent of land surface covered by all living vegetation (and remnant vegetation yet to decompose) within 20 feet of the ground.

Vegetative Manipulation -- Alteration of present vegetation by using fire, plowing, or other means to manipulate natural successional trends.

Visitor Day -- Twelve hours of recreational use by one or more persons.

Visual Resource(s) -- The land, water, vegetation and animals that comprise the scenery of an area.

Water Quality -- The chemical, physical and biological characteristics of water with respect to its suitability for a particular use.

Watershed -- All lands which are enclosed by a continuous hydrologic drainage divide and lie upslope from a specified point on a stream.

Watershed Cover -- The material (vegetation, litter, rock) covering the soil and providing protection from, or resistance to, the impact of raindrops and the energy of overland flow.

Watershed Values -- Soil productivity and erosional stability and the storage, yield, quality, and quantity of surface and subsurface waters.

Water Yield -- The quantity of water derived from a unit area of watershed.

Wilderness Study Area (WSA) -- A roadless area that has been inventoried and found to be wilderness in character, having few human developments and providing opportunities for solitude and primitive recreation, as described in Section 603 of the Federal Land Policy and Management Act and Section 2(c) of the Wilderness Act of 1964.

Withdrawals -- Actions which restrict the use of public lands and segregate the lands from the operation of some or all of the public land or mineral laws.

Index

Area of Critical Environmental Concern 5, 20, 52, 80
Aquatic Habitat 6, 20, 37, 63
Agricultural Use 5, 20, 21, 22, 44, 60, 63, 66
Archaeological Sites 20, 22, 52, 80
Big Summit Prairie 1, 30, 36, 40
Confederated Tribes of Warm Springs 1, 5, 6, 8, 50, 75
Columbia River 1, 17, 30, 36, 37, 42
Crook County 1, 75
Federal Land Policy and Management Act 1, 4, 5, 7, 17, 80
Gilliam County 7, 44, 46, 74
Hood River County 7, 44, 74
Historic Site 20, 21, 22, 52
Jefferson County 5, 7, 44, 46, 48, 74
Mineral Estate 1, 16, 20, 21, 22, 42, 83
Monitoring 15, 58
Mt. Hood National Forest 1, 33, 36
National Park Service 1, 6, 75
Noxious Weeds 7, 15, 82
Ochoco National Forest 1, 5, 6
Oregon Department of Fish and Wildlife 5, 7, 13, 15, 20, 36, 48, 74, 75
Oregon Department of Forestry 7, 15, 74, 75
Oregon Land Conservation and Development Commission 7
Oregon State Marine Board 5, 48
Oregon State Parks and Recreation Division of the Department of Transportation 5, 20, 21, 44, 48, 74, 75
Outstanding Natural Areas 5, 20
Off Road Vehicles 5, 20, 21, 22, 48, 49, 63, 69, 70, 71, 82
Paleontology 50, 58
Research Natural Area 5, 20
Rockhounding 20, 21, 22, 48, 49, 50, 69
Sherman County 5, 7, 44, 48, 74, 75
Threatened, Endangered or Sensitive Species 5, 6, 13, 15, 17, 32, 33, 36, 58, 61, 84
Timber Production Capability Classification (TPCC) 40, 84
Umatilla National Forest 1, 33
U.S. Fish and Wildlife Service 6, 13, 15, 74, 75
Wasco County 5, 7, 44, 48, 74, 75
Wilderness Study Areas 5, 6, 12, 13, 17, 84
Wheeler County 7, 44, 46, 74, 75

Appendices

Mule team pulling wheat combine near the Columbia River

Appendix A Public Involvement

A total of 42 written responses were received from a mailing of 528 copies of the Two Rivers Resource Management Plan Preliminary Issues and Alternatives Brochure. A total of 11 persons attended the two public meetings which were held in Condon on May 9, 1984 and in Grass Valley on May 10, 1984.

Based on that public comment, emphasis on management of riparian areas was changed to protect soil, maintain or enhance water quality and quantity as well as fisheries and wildlife habitat. Water quality was determined to be a significant issue, but it was also determined that the quality and quantity of water on public lands would be directly affected by any change in riparian vegetation condition. Water quality is therefore dealt with in conjunction with the management of riparian areas.

Unauthorized agricultural use of public land and conditions under which public lands would be retained, transferred, exchanged or sold surfaced as issues. Policies related to those issues were clarified and made more specific.

Consideration of special management areas was determined to be an issue that should be addressed in this RMP/EIS. A discussion of these special areas is now included in all alternatives.

Some resource objectives under various alternatives were changed to more realistically provide a variety of ways public lands in the Two Rivers Planning Area could be managed. Examples of these changes can be found in the forestry, minerals, and recreation management program.

It was determined that the riparian management objective for Alternative B (Emphasize Commodity Production and Enhancement of Economic Benefits) was inconsistent with the intent of that alternative. The objective was therefore modified to manage the areas at 60 percent of vegetative potential rather than attempt to achieve or maintain a good or excellent channel stability rating.

It was determined that a wider range of livestock grazing levels should be analyzed. Objectives for livestock grazing in Alternative D (Emphasize Natural Values While Accommodating Commodity Production) were changed as a result to also provide for exclusion of livestock grazing within the highly scenic and intensively used recreation areas of the Lower Deschutes and Lower John Day river canyons.

Other changes resulting from public comment are included in the discussion of forestry, minerals management, visual resources, cultural resources, fire management, utility corridors, soil, air, water, threatened, endangered or sensitive species and noxious weeds.

The need for integration of plans related to wilderness management after designation and recreation river management on the Deschutes and John Day rivers and the Two Rivers Planning Area is acknowledged and will be carried out. Interim wilderness management policy will be followed in the five wilderness study areas being considered for wilderness designation as the Two Rivers RMP/EIS is developed and implemented.

In this RMP/EIS, public opinion seemed to indicate the four existing alternatives presented in the issues and alternatives brochure, combined with the preferred alternative, would provide a reasonable range of possible management methods for the public lands in the Two Rivers Planning Area.

Public Response to Proposed Land Use Alternatives Booklet

On August 31, 1984, 622 copies of the proposed land use alternatives booklet were mailed to interested agencies, organizations and individuals. In response to that mailing, 31 written comments were received. These comments were used in several ways during the development of the preferred alternative. There was unanimous public support for the protection of riparian areas. The preferred alternative objective for riparian management would mean livestock grazing will need to be managed more intensively.

More specific criteria to authorize agricultural use and lease mineral resources on public lands were developed and incorporated into the preferred alternative as a result of public comment.

The protection of sensitive or fragile resources such as the 13 identified special management areas and areas with high visual quality was also generally supported. Based on the comments, surface

disturbing activities, such as removal of forest products, exploration of minerals, use of off road vehicles, etc., will be curtailed or eliminated in these areas under the preferred alternative.

Appendix B Planning Overview

The process involved in preparing this document enables the Bureau of Land Management to address use of public lands while complying with federal laws and policies. The process includes nine steps, with an emphasis on public participation at several key stages.

1. Identification of Issues

This step identified resource management problems or conflicts that could be resolved through the planning process. Public participation was required in this step which was completed in April 1984.

2. Development of Planning Criteria

Public input was also involved in this stage of the process, which identified the material needed to clarify the issues; the types of alternatives to be developed and explored; and factors considered in reaching decisions on the alternatives including the selection of a "preferred" resource management plan. This step was completed in August 1984.

3. Inventory Data and Collect Information

The collection of data comprised the third important step in the process. The material collected was related to environmental, social, economic and institutional data needed to complete the planning process. This step was completed in September 1984.

4. Analysis of the Present Management Situation

This step assessed the way lands in the planning area are now used and/or managed. It included a description of BLM management guidance being used; a discussion of problems related to that management and opportunities to resolve those problems; and a consolidation of existing data needed to analyze and resolve the problems that were identified. This step was esentially completed in March of 1984, although portions were revised as late as October 1984 to reflect final inventory data.

5. Forming Alternatives--Including a "Preferred" Alternative

Several resource management proposals were prepared in this step. Included was an alternative called a "no action" proposal which suggested continuing existing management levels or systems for resource use. Several proposals in this step attempted to resolve the controversial issues while placing emphasis on either environmental protection or resource production. This step was completed in October 1984.

6. Estimating the Effects of the Alternatives

In an effort to allow for a comparative evaluation of impacts that could result from each of the proposed alternatives, the anticipated impacts were projected on the basis of their physical, biological, economic and social values. This draft RMP/EIS is intended to meet the requirements of this step.

7. Identifying a "Preferred" Resource Management Plan

Using the information obtained in Step 6, the Prineville BLM District Manager identified a "preferred" resource management plan--the alternative he feels will best serve the purposes of the planning area, the public and the administering agency. This draft RMP/EIS, including the proposed preferred alternative, has been prepared for public distribution and comment. When this document has been reviewed and public comments have been received and evaluated, a final RMP/EIS will be prepared. This step will be completed in September 1985.

8. Selection of the Resource Management Plan

The District Manager will use staff evaluation of public comments to select and recommend a resource management proposal to the Oregon State Director of the Bureau of Land Management. The State Director, in turn, will review and publish the resource management plan and file the environmental impact statement with the Environmental Protection Agency. A 30 day comment period will be provided for the proposed plan. The final RMP/EIS will contain issues which were submitted for the record during the planning. A protest may raise only those issues. A final

decision on the proposal will be made after the plan has been reviewed by the governor of the State of Oregon for consistency with officially approved or adopted natural resource related State or local plans, programs or policies. This step is expected to be completed in the spring of 1986.

9. Monitoring and Evaluation

The final step involves the collection and analysis of trend data and of the long term condition of the resources to determine how effective the plan will be/has been in resolving identified issues. That process is necessary to insure the plan is achieving the desired results. Monitoring of the plan will continue from the time the resource management plan is adopted until changing conditions require revising the entire plan or any part of it.

Appendix C Planning Criteria

A preferred land use alternative is developed by evaluating available data and then selecting the allocation which best meets national guidance outlines and best satisfies decision criteria listed below.

Livestock Grazing

The long term objective is for stabilizing the livestock industry and producing a sustained level of forage to meet regional and national needs while also meeting the terms of the Federal Land Policy and Management Act, the the Taylor Grazing Act, and the Public Rangeland Improvement Act.

Wildlife and Fish Habitat

The long term objective is for protection and development of wildlife habitat, fish spawning, rearing or migration routes and year round food, water and shelter.

Forestry

The long term objective is a sustainable, allowable harvest which assists in meeting local and regional needs. Other resource values will be protected by using appropriate restrictions on, or exclusions of, forest activities.

Minerals

The long term objective is exploration and development of mineral resources, consistent with BLM policies, while protecting other resource values.

Lands

The long term objective is land allocations for the development of access, right of way and utility corridor designations while protecting other significant resource values. Land exchanges, transfers and sales are provided for.

Recreation

The long term objective is to meet the demand for dispersed recreation opportunities.

Visual

The long term objective is to maintain the visual quality of the landscape, especially in areas of high visual quality.

Threatened or Endangered Species

Threatened, endangered or federal candidate plant or animal species will be protected. No adverse modification of their habitat would be permitted, subject to formal consultation with the U.S. Fish and Wildlife Service.

Special Management Areas

The long term objective is to provide areas for scientific and educational studies in such areas as Areas of Critical Environmental Concern and Research Natural Areas.

Cultural Resources

The long term objective is to protect cultural resources by regulations outlined in applicable laws and rules.

Soil, Water and Air

The long term objective is to protect the quality of soil, water and air resources. Compliance with applicable pollution control laws is provided for, as well as coordination with other State, local and Federal agencies.

Economics

The significance of local employment and personal earnings are considered in decisions relating to raw materials, recreation and other use opportunities on public land.

Appendix D --Goals and Objectives of Land Use Alternatives

Alternative A (Preferred Alternative)

Goal: Provide for Commodity Production While Protecting Natural Values

Objectives:

1. Maintain forage production and livestock use at 17,778 AUMs. Maintain current livestock grazing levels and meet riparian and upland vegetation management objectives.

2. Manage riparian areas along the Deschutes and John Day rivers and their major tributaries to full potential, with a minimum of 60 percent of the vegetative potential to be achieved within 20 years.

3. Provide forage to meet management objective numbers of the Oregon Department of Fish and Wildlife for deer and elk. Manage upland vegetation to achieve maximum wildlife habitat diversity. Manage all streams with fisheries or fisheries potential to achieve a good to excellent aquatic habitat condition.

4. Place emphasis on retaining and expanding, by exchange of public land, holdings in: (1) areas of national significance, (2) areas where management is cost effective, and (3) where land is most appropriately managed in public ownership due to significant multiple resource values. Public lands having no reasonable opportunity for exchange would be offered for sale if they are:

(1) difficult and uneconomical to manage and are not needed by another agency, (2) no longer needed for the specific purpose for which they were acquired or for any other Federal purpose; (3) provide greater benefits to the public in private ownership. The transfer of public lands to other public land management agencies would occur if more efficient management of the land would result.

Authorize agricultural use of public lands if proposals were consistent with the management and protection of other values.

Pursue attempts to acquire limited public access through exchange or negotiated easement, consistent with management objectives.

5. Intensively manage commercial forestlands suitable for timber production but recognize harvest restrictions or exclusions to protect riparian vegetation, wildlife, visual and other resource values.

6. Keep public lands open for exploration and development of mineral resources and related rights of way. Retain restrictive stipulations for oil and gas exploration and development on 132,000 acres of public land.

7. Designate public lands open to off road vehicles except in areas where significant damage to soils, vegetation, wildlife or scenic values is resulting from that use.

Areas having high or moderate quality collectible mineral resources, including plant and invertebrate fossils, would be available for rockhound purposes and would be recognized in land use decisions. Public use areas would be reviewed on a case by case basis to insure that no significant conflict exists with the protection of other natural values.

8. Designate areas with identified outstanding natural or cultural values as research natural areas, areas of critical environmental concern, or outstanding natural areas. Maintain or improve other unique wildlife or ecological values.

Alternative B (Commodity Production)

Goal: Emphasize Commodity Production and Enhancement of Economic Benefits

Objectives:

1. Increase forage production and allocation for livestock use as a result of an intensive rangeland management program.

2. Manage important riparian areas along the Deschutes and John Day rivers and major tributaries for their primary purpose of soil and water quality protection and fish and wildlife habitat. Manage these areas to achieve a goal of 60 percent of potential vegetative production within 20

years. Manage, or exclude, livestock grazing to achieve this objective.

3. Continue existing habitat management plans. Meet long term forage needs for deer and elk as recommended by the Oregon Department of Fish and Wildlife.

4. Retain public lands with high public values (wildlife, recreation, riparian, watershed) in public ownership or exchange for other lands with higher public value. Consider selling public lands if they are: (1) difficult and uneconomical to manage and are not needed by another agency; (2) no longer needed for the specific purpose for which they were acquired or for any other Federal purpose; (3) provide greater benefits to the public in private ownership.

Authorize agricultural use of public land through permit, lease or sale.

Acquire legal access to public lands for maximum public use.

5. Intensively manage commercial forestlands suitable for timber production, with minimal constraints for protection of other resources.

6. Keep public lands open for the exploration and development of mineral resources, rights of way and public purposes. Reduce the area of no surface occupancy restriction to include the one half mile wide state scenic waterways corridor in the Deschutes and John Day canyons.

7. Designate public lands, except for areas being significantly damaged by ORV use, as open to off road vehicle use.

Areas having collectible mineral resources, including plant and invertebrate fossils, would be available for rockhounding. Management and use of the areas would be recognized in land use decisions and would be reviewed on a case by case basis to ensure that no significant conflict exists with the protection of other natural values.

8. Continue existing restrictions in formally designated special management areas such as the Deschutes and John Day State Scenic Waterways. Intensively manage remaining areas for timber, grazing and mineral development. Designate areas of critical environmental concern where no significant conflicts exist.

Alternative C (Existing Management)

Goal: Continue Existing Management (No Action)

Objectives:

1. Maintain existing rangeland developments and current use for livestock grazing. Continue BLM work with livestock operators to manage allotments in a cooperative manner.

2. Continue riparian area exclosures on a limited basis. Maintain existing developments. Continue efforts to implement grazing management systems in riparian areas to improve soil, water, fish and wildlife habitat.

3. Manage habitat for deer and elk with existing plans. Meet forage requirements on public lands where the Oregon Department of Fish and Wildlife has established management objective numbers for deer and elk.

4. Continue to sell a limited number of isolated tracts which are: (1) difficult and uneconomical to manage and are not needed by another agency; (2) no longer needed for the specific purpose for which they were required or for any other Federal purpose; or (3) provide greater benefits to the public in private ownership. Exchange other public land parcels for lands with higher public value, with emphasis on the Lower Deschutes River and Lower John Day River areas.

Authorize agricultural use of public lands by permit or lease when no significant conflicts exist.

Limited acquisition of easements for public access would occur.

5. Adjust the sustained harvest level of timber on specific lands when appropriate to accommodate wildlife, existing fish habitat and riparian considerations. Withdraw commercial forestlands suitable for timber production from production only when restrictions and/or mitigation would not adequately protect other resources.

6. Keep public lands open for exploration and development of mineral resources, rights of way and public purposes. Maintain existing stipulations for no surface occupancy on oil and gas exploration

and development in all sensitive areas.

7. Same as Alternative B.

8. Continue efforts to protect identified special management areas. Continue cooperative management responsibilities with other agencies.

Alternative D (Natural Values With Commodities)

Goal: Emphasize Natural Values While Accommodating Commodity Production.

Objectives:

1. Exclude livestock grazing from high quality visual areas and intensively used recreation areas on public lands in the Lower Deschutes and Lower John Day River canyons. Exclude livestock from allotments within crucial or important wildlife habitat areas.

2. Fence riparian areas on public lands to exclude grazing where benefits exceed the cost of fence construction. Manage areas where fencing is not feasible to maintain or achieve 60 percent of the vegetative potential within 20 years.

3. Give special consideration to management of wildlife habitat on public land in all areas. Meet deer and elk forage requirements management objective numbers of the Oregon Department of Fish and Wildlife. Consider rangeland developments with principal benefits to wildlife.

4. Same as Alternative A.

5. Same as Alternative A.

6. Allow exploration and development of mineral resources where no significant conflicts exist with wildlife, riparian, or recreation values. Restrictions would be considered, however, in areas with high public value.

7. Restrict off road vehicle use on public lands where unacceptable damage is occurring to wildlife, riparian, ecological, or primitive recreation values. Limit or close areas where ORV use is not presently occurring, but which would be damaged if ORV use was allowed.

Manage recreational mining (rockhounding) in the same manner as described under Alternative A.

8. Same as Alternative A.

Alternative E

Goal: Emphasize Natural Values.

Objectives:

1. Eliminate livestock grazing from public lands in the planning area. No rangeland developments would be constructed except for fences to exclude livestock. Only maintenance of exclusion fences would occur.

2. Exclude riparian areas on public lands from grazing.

3. Same as Alternative D.

4. No public lands would be offered for sale. Emphasize exchanges that improve wildlife, riparian, watershed and other natural values.

No agricultural use of public lands would be authorized.

No acquisition of legal public access would occur.

5. No regularly scheduled forest product sales would occur. Harvest of diseased or damaged timber would occur if it did not conflict with wildlife and fisheries habitat, visual, riparian or other resource value protection and enhancement.

6. Allow exploration and development of mineral resources where no significant conflicts exist with wildlife, riparian, recreation or scenic values.

7. Close or limit access to public lands where unacceptable damage is occurring, or would occur if off road vehicles were to use the area. Close public lands where significant wildlife, riparian, ecological primitive recreation or visual values would be adversely affected by off road vehicle use.

Areas having high quality collectible mineral resources, including plant and invertebrate fossils, would be available for rockhounding. Management and use of these areas would be recognized in land

use decisions and would be reviewed on a case by case basis to ensure that no significant conflict exists with the protection of other natural values.

8. Areas with outstanding natural and/or visual values would be designated as research natural areas or areas of critical environmental concern. Remaining special management areas would be protected.

APPENDIX E - Selective Management Category, Acrea Public Land, Current Livestock Use and Ecological Condition by Allotment

ALLOT. NUMBER	SELECTIVE MANAGEMENT CATEGORY	ACRES PUBLIC LAND	LIVESTOCK KIND	GRAZING PERIOD BEGIN-END	CURRENT ACTIVE USE	BLM ACRES BY ECOLOGICAL CONDITION CLASS CLIMAX	LATE SERAL	MID SERAL	EARLY SERAL	UNCLASS/ OTHER
2500	CUSTODIAL	80	CATTLE	1001- 228	10	18	16	0	44	2
2501	IMPROVE	1,999	CATTLE	401-1231	101	0	608	223	1,093	75
2502	CUSTODIAL	280	CATTLE	615-1130	35	23	95	85	77	0
2503	IMPROVE	360	CATTLE	615-1021	17	29	122	109	100	0
2504	CUSTODIAL	160	CATTLE	501-1031	18	39	102	13	0	6
2505	CUSTODIAL	400	CATTLE	301- 501	55	73	248	64	0	15
2506	CUSTODIAL	200	CATTLE	401-1107	19	9	78	68	38	7
2507	CUSTODIAL	120	CATTLE	901- 930	9	10	41	36	33	0
2508	MAINTAIN	842	CATTLE	415-1129	45	68	285	255	234	0
2509	IMPROVE	1,840	CATTLE	401- 614	82	1,246	166	103	257	68
2512	IMPROVE	14,880	CATTLE	301-1218	605	197	1,861	4,211	8,070	551
2513	MAINTAIN	1,215	CATTLE	401-1217	60	83	439	464	204	45
2514	MAINTAIN	3,325	CATTLE	401-1031	224	0	558	1,799	745	123
2515	MAINTAIN	280	CATTLE	616-1031	9	0	270	0	0	10
2517	CUSTODIAL	119	CATTLE	501-1031	6	0	56	0	59	4
2518	IMPROVE	5,418	CATTLE	416-1117	346	1,188	3,132	785	113	200
2519	MAINTAIN	1,301	CATTLE	501-1223	149	105	441	394	361	0
2520	IMPROVE	2,596	CATTLE	401- 930	93	552	999	0	949	96
2521	IMPROVE	737	CATTLE	701- 901	43	0	80	630	0	27
2522	IMPROVE	2,527	CATTLE	501-1031	66	540	1,050	457	377	93
2523	CUSTODIAL	130	CATTLE	301- 430	2	10	44	39	36	1
2524	CUSTODIAL	441	CATTLE	501- 930	10	123	169	132	0	17
2525	MAINTAIN	2,074	CATTLE	301- 228	231	0	930	760	267	77
2526	CUSTODIAL	760	CATTLE	315- 131	60	208	191	250	83	28
2528	CUSTODIAL	1,240	CATTLE	415-1124	44	0	474	0	720	46
2529	CUSTODIAL	3,480	CATTLE	601- 930	304	23	1,258	2,007	63	129
2530	CUSTODIAL	712	CATTLE	401-1123	118	93	480	0	112	27
2531	MAINTAIN	5,294	CATTLE	501- 930	192	0	3,852	0	1,246	196
2532	CUSTODIAL	1,633	CATTLE	401-1215	102	21	864	54	634	60
2533	MAINTAIN	6,995	CATTLE	401-1215	403	897	1,911	988	2,940	259
2534	CUSTODIAL	80	CATTLE	701- 831	6	6	27	24	22	1
2535	CUSTODIAL	345	CATTLE	520-1104	11	0	301	31	0	13
2536	IMPROVE	5,219	CATTLE	401-1231	45	0	3,188	438	1,399	194
2537	IMPROVE	1,360	CATTLE	1101- 228	72	176	414	408	312	50
2538	IMPROVE	2,999	CATTLE	416-1014	206	146	2,153	249	339	112
2539	CUSTODIAL	109	CATTLE	401- 715	14	0	0	0	105	4
2540	CUSTODIAL	40	CATTLE	401- 901	5	3	14	12	11	0
2541	IMPROVE	1,760	CATTLE	401- 630	12	1,333	242	83	38	66
2542	MAINTAIN	970	CATTLE	501-1031	133	78	329	294	269	0
2543	CUSTODIAL	583	CATTLE	501- 831	32	0	0	335	226	22
2544	IMPROVE	518	CATTLE	401-1231	9	0	0	499	0	19
2545	IMPROVE	11,095	CATTLE	301- 228	438	892	3,759	3,362	3,082	0
2546	CUSTODIAL	40	CATTLE	501-1031	2	10	0	0	29	1
2547	IMPROVE	2,357	CATTLE	301- 525	245	102	1,873	333	0	89
2548	CUSTODIAL	160	CATTLE	301- 228	12	0	52	57	44	7
2549	MAINTAIN	1,002	CATTLE	301-1209	84	0	66	850	48	38
2550	CUSTODIAL	200	CATTLE	501- 715	25	16	68	61	55	0
2551	IMPROVE	1,646	CATTLE	301- 126	98	0	377	669	340	60
2552	CUSTODIAL	40	CATTLE	801- 930	2	3	14	12	11	0
2553	IMPROVE	1,127	CATTLE	401- 831	20	301	0	401	384	41
2554	IMPROVE	2,557	CATTLE	401-1130	120	0	556	1,751	156	94
2556	IMPROVE	1,045	CATTLE	401-1219	43	59	122	362	463	39
2557	CUSTODIAL	160	CATTLE	301-1015	15	13	54	48	44	1
2558	IMPROVE	5,741	SHEEP	401-1002	352	28	1,833	2,668	999	213
2559	CUSTODIAL	762	CATTLE	401-1115	86	61	258	231	212	0
2560	MAINTAIN	598	CATTLE	416-1015	30	17	121	145	293	22
2561	IMPROVE	587	CATTLE	301-1115	61	0	288	298	0	21
2562	IMPROVE	115	CATTLE	401- 731	4	9	39	35	32	0
2563	MAINTAIN	1,062	CATTLE	501-1109	63	0	160	530	333	39
2564	MAINTAIN	325	CATTLE	401-1031	28	0	0	62	251	12
2565	CUSTODIAL	431	CATTLE	415-1103	33	0	210	205	0	16

ALLOT. NUMBER	SELECTIVE MANAGEMENT CATEGORY	ACRES PUBLIC LAND	LIVESTOCK KIND	GRAZING PERIOD BEGIN-END	CURRENT ACTIVE USE	BLM ACRES BY ECOLOGICAL CONDITION CLASS CLIMAX	LATE SERAL	MID SERAL	EARLY SERAL	UNCLASS/ OTHER
2566	CUSTODIAL	113	CATTLE	316- 430	3	9	38	34	31	1
2567	IMPROVE	1,509	CATTLE	301- 228	59	0	499	309	645	56
2568	CUSTODIAL	618	CATTLE	501-1033	29	0	0	0	595	23
2569	IMPROVE	2,001	CATTLE	401- 202	71	203	1,239	219	266	74
2570	IMPROVE	1,607	CATTLE	401- 127	58	0	0	1,548	0	59
2571	IMPROVE	5,023	SHEEP	301- 228	836	0	632	3,481	725	185
2572	IMPROVE	3,655	CATTLE	601-1031	85	2,286	45	368	841	135
2574	CUSTODIAL	200	CATTLE	401-1015	13	0	193	0	0	7
2575	IMPROVE	55	CATTLE	501- 531	1	0	0	14	39	2
2578	CUSTODIAL	2,194	SHEEP	501- 930	166	421	774	0	918	81
2579	MAINTAIN	840	CATTLE	301- 228	42	0	545	15	250	30
2580	MAINTAIN	1,267	CATTLE	501-1031	145	102	429	384	352	0
2581	MAINTAIN	920	CATTLE	501-1015	22	68	623	195	0	34
2582	CUSTODIAL	40	CATTLE	501-1031	6	3	14	12	11	0
2583	MAINTAIN	200	CATTLE	701-1022	15	0	0	47	146	7
2584	IMPROVE	14,683	CATTLE	301- 228	526	151	3,421	4,017	6,550	544
2585	CUSTODIAL	320	CATTLE	401- 719	11	0	285	0	23	12
2586	IMPROVE	1,800	CATTLE	401-1115	70	0	141	378	1,214	67
2587	IMPROVE	2,101	CATTLE	301-1215	78	0	17	0	2,006	78
2588	MAINTAIN	608	CATTLE	1001- 228	40	0	427	0	159	22
2589	CUSTODIAL	40	CATTLE	601- 630	1	3	14	12	11	0
2591	IMPROVE	1,875	CATTLE	510-1031	46	171	731	741	162	70
2592	IMPROVE	595	SHEEP	401- 107	51	0	172	111	289	23
2593	MAINTAIN	1,240	CATTLE	401-1031	133	0	1,046	148	0	46
2594	MAINTAIN	65	CATTLE	301- 531	3	5	22	20	18	0
2595	IMPROVE	833	CATTLE	325-1031	53	0	80	141	581	31
2596	CUSTODIAL	120	CATTLE	501-1031	12	10	41	36	33	0
2597	IMPROVE	7,585	CATTLE	301- 124	227	981	3,407	2,092	825	280
2598	IMPROVE	1,518	CATTLE	1015- 228	37	122	514	460	422	0
2599	CUSTODIAL	160	CATTLE	401- 228	10	27	42	0	85	6
2600	CUSTODIAL	935	CATTLE	301-1218	48	0	0	333	567	35
2601	CUSTODIAL	160	CATTLE	601- 131	14	13	54	48	44	1
2602	CUSTODIAL	40	CATTLE	601- 930	4	3	14	12	11	0
2603	MAINTAIN	300	CATTLE	801- 228	14	0	0	76	271	13
2604	MAINTAIN	1,0[illegible]	CATTLE	301- 228	64	0	193	184	608	37
2605	CUSTODIAL	2[illegible]	CATTLE	1001- 131	12	23	95	85	77	0
2606	CUSTODIAL	[illegible]	CATTLE	601- 930	4	0	77	0	0	3
2607	MAINTAIN	800	CATTLE	401-1104	50	120	651	0	0	29
2608	IMPROVE	4,487	CATTLE	815- 228	163	122	1,556	2,142	502	165
2609	MAINTAIN	1,085	CATTLE	325- 228	56	87	398	328	301	0
2610	IMPROVE	1,671	CATTLE	401- 228	29	0	998	259	352	62
2611	MAINTAIN	680	CATTLE	301- 705	25	0	467	161	27	25
2612	CUSTODIAL	40	CATTLE	301- 401	1	3	14	12	11	0
2613	CUSTODIAL	200	CATTLE	501- 831	4	0	0	193	0	7
2614	IMPROVE	1,893	CATTLE	401- 214	73	0	0	0	1,823	70
2615	CUSTODIAL	145	CATTLE	810-1009	4	0	0	0	140	5
2616	CUSTODIAL	182	CATTLE	601- 920	11	0	141	0	15	6
2617	MAINTAIN	661	CATTLE	316-1001	26	55	254	0	327	25
2618	IMPROVE	12,597	CATTLE	301- 228	708	3,362	4,864	1,900	2,006	465
2620	CUSTODIAL	177	CATTLE	416- 715	3	170	0	0	0	7
2621	CUSTODIAL	232	CATTLE	416- 915	35	19	79	70	64	0
2622	CUSTODIAL	121	CATTLE	401-1031	7	0	0	117	0	4
2623	MAINTAIN	2,826	SHEEP	301- 228	174	53	817	274	1,578	104
2624	CUSTODIAL	328	CATTLE	315-1014	7	0	0	0	316	12
2625	IMPROVE	1,340	CATTLE	301- 607	65	0	0	1,121	169	50
2626	IMPROVE	8,618	CATTLE	401-1031	469	461	1,423	4,022	2,393	319
2627	CUSTODIAL	676	CATTLE	901-1130	30	0	0	288	365	25
2628	IMPROVE	840	CATTLE	301- 228	152	0	97	265	447	31
2629	IMPROVE	2,889	CATTLE	516-1019	113	532	1,281	458	511	107
2630	IMPROVE	80	CATTLE	915-1231	7	6	27	24	22	1
2631	MAINTAIN	1,160	CATTLE	401-1007	25	696	292	0	129	43
2632	CUSTODIAL	400	CATTLE	401-1231	27	0	385	0	0	15
2633	IMPROVE	2,780	CATTLE	301- 228	167	224	942	842	772	0
2634	CUSTODIAL	160	CATTLE	315- 605	32	0	154	0	0	6
2635	CUSTODIAL	289	CATTLE	401-1019	20	0	28	91	159	11
2636	CUSTODIAL	343	CATTLE	416-1015	6	0	0	159	171	13
2637	MAINTAIN	223	CATTLE	401- 228	15	0	67	23	124	9
2638	CUSTODIAL	144	CATTLE	301-1231	10	12	49	44	39	0
2639	CUSTODIAL	429	CATTLE	301-1110	50	34	145	130	119	1
2641	CUSTODIAL	78	CATTLE	301- 331	3	6	26	24	22	0
2642	IMPROVE	4,308	CATTLE	401-1105	265	0	1,496	1,366	1,287	159

ALLOT. NUMBER	SELECTIVE MANAGEMENT CATEGORY	ACRES PUBLIC LAND	LIVESTOCK KIND	GRAZING PERIOD BEGIN-END	CURRENT ACTIVE USE	BLM ACRES BY ECOLOGICAL CONDITION CLASS CLIMAX	LATE SERAL	MID SERAL	EARLY SERAL	UNCLASS/ OTHER
2643	IMPROVE	80	CATTLE	516-1015	5	6	27	24	22	1
2644	MAINTAIN	640	CATTLE	301- 228	98	0	616	0	0	24
2645	IMPROVE	3,987	CATTLE	415-1016	152	37	2,132	874	776	148
2646	CUSTODIAL	147	CATTLE	501-1012	27	12	50	45	40	0
2647	IMPROVE	1,191	CATTLE	410- 226	64	0	212	728	206	45
2648	IMPROVE	540	CATTLE	301-1031	16	43	183	164	150	0
2649	CUSTODIAL	301	CATTLE	415- 731	3	0	172	0	118	11
2650	MAINTAIN	550	CATTLE	501-1031	65	0	0	530	0	20
2651	CUSTODIAL	280	CATTLE	520- 819	3	0	0	228	42	10
2652	CUSTODIAL	40	CATTLE	801- 831	1	3	14	12	11	0
2653	CUSTODIAL	38	CATTLE	401- 531	2	0	0	0	37	1
2654	CUSTODIAL	15	CATTLE	801- 831	1	1	5	5	4	0
2655	CUSTODIAL	356	CATTLE	401-1031	21	0	0	128	214	14
2656	CUSTODIAL	275	CATTLE	416-1115	7	22	93	83	76	1
2657	CUSTODIAL	51	CATTLE	415- 614	2	4	17	15	14	1
2660	CUSTODIAL	280	CATTLE	301- 130	11	23	95	85	77	0
2661	CUSTODIAL	320	CATTLE	401-1117	53	26	108	97	89	0
4076	CUSTODIAL	280	CATTLE	———	—	23	95	85	77	0
4131	CUSTODIAL	871	CATTLE	———	—	70	295	264	242	0
4145	CUSTODIAL	3,587	CATTLE	———	—	288	1,215	1,087	996	1
7501	IMPROVE	4,737	CATTLE	301-1116	265	704	2,967	521	369	176
7503	CUSTODIAL	1,615	CATTLE	501-1031	191	0	0	1,056	489	60
7505	CUSTODIAL	160	CATTLE	301-1030	8	0	65	0	89	6
7507	IMPROVE	1,760	CATTLE	401- 731	112	120	508	787	280	65
7508	CUSTODIAL	360	CATTLE	301- 516	48	29	122	109	100	0
7510	CUSTODIAL	120	CATTLE	315-1101	27	0	77	0	39	4
7511	IMPROVE	2,494	CATTLE	301- 228	373	34	592	973	803	92
7512	CUSTODIAL	440	CATTLE	301- 228	45	0	131	292	0	17
7513	MAINTAIN	375	CATTLE	301- 228	48	30	127	114	104	0
7514	CUSTODIAL	455	CATTLE	516- 630	27	0	0	0	438	17
7516	CUSTODIAL	120	CATTLE	701- 906	11	10	41	36	33	0
7517	CUSTODIAL	90	CATTLE	301- 430	6	7	30	27	25	1
7518	IMPROVE	1,350	CATTLE	407- 630	76	0	0	605	695	50
7519	CUSTODIAL	740	CATTLE	301- 531	35	459	72	181	0	28
7520	CUSTODIAL	197	CATTLE	301-1031	8	16	67	60	54	0
7521	CUSTODIAL	190	CATTLE	301- 415	14	0	31	53	99	7
7523	CUSTODIAL	265	CATTLE	———	0	0	0	0	255	10
7524	CUSTODIAL	213	CATTLE	401- 407	25	0	77	0	128	8
7525	CUSTODIAL	500	CATTLE	401- 630	21	0	141	223	117	19
7526	CUSTODIAL	400	CATTLE	501-1130	38	0	385	0	0	15
7527	CUSTODIAL	779	CATTLE	501-1115	57	0	0	502	248	29
7528	CUSTODIAL	150	CATTLE	401-1031	20	0	0	144	0	6
7529	MAINTAIN	1,062	CATTLE	301- 228	98	0	0	1,023	0	39
7530	CUSTODIAL	92	CATTLE	501- 731	32	3	11	10	8	0
7531	CUSTODIAL	261	CATTLE	301- 930	10	0	0	219	32	10
7532	CUSTODIAL	425	CATTLE	501- 930	32	0	409	0	0	16
7533	MAINTAIN	1,577	CATTLE	401- 815	120	0	1,190	119	210	58
7534	CUSTODIAL	655	CATTLE	301- 228	56	0	0	429	202	24
7535	CUSTODIAL	434	CATTLE	301- 228	52	0	112	52	254	16
7536	CUSTODIAL	342	CATTLE	516-1015	28	0	0	329	0	13
7537	CUSTODIAL	39	CATTLE	601- 930	7	0	0	23	15	1
7538	CUSTODIAL	181	CATTLE	302- 915	26	0	0	0	174	7
7539	CUSTODIAL	647	CATTLE	501- 731	80	0	496	0	127	24
7540	CUSTODIAL	1,695	CATTLE	501- 930	172	0	1,214	418	0	63
7541	MAINTAIN	1,004	CATTLE	301- 228	165	116	21	214	616	37
7542	MAINTAIN	279	CATTLE	301- 430	50	0	30	0	239	10
7543	CUSTODIAL	208	CATTLE	601-1110	18	0	63	67	70	8
7544	CUSTODIAL	55	CATTLE	401-1130	7	0	0	0	53	2
7545	IMPROVE	438	CATTLE	301- 831	54	0	318	104	0	16
7546	CUSTODIAL	80	CATTLE	701- 831	12	0	77	0	0	3
7547	IMPROVE	6,489	CATTLE	1101- 228	551	193	729	3,365	1,961	241
7548	CUSTODIAL	595	CATTLE	515-1015	41	0	83	490	0	22
7549	CUSTODIAL	80	CATTLE	315-1015	6	0	0	0	77	3
7550	CUSTODIAL	2,235	CATTLE	401- 225	291	0	1,233	291	628	83
7551	MAINTAIN	883	CATTLE	1101-1130	87	0	0	427	423	33
7553	CUSTODIAL	647	CATTLE	401- 831	12	228	256	42	97	24
7555	CUSTODIAL	160	CATTLE	301- 930	21	13	54	48	44	1
7556	CUSTODIAL	160	CATTLE	501- 630	18	0	0	154	0	6
7557	CUSTODIAL	120	CATTLE	401-1215	12	0	0	116	0	4
7558	CUSTODIAL	1,028	CATTLE	315-1115	131	0	879	26	85	38
7560	CUSTODIAL	960	CATTLE	415-1130	85	0	411	221	293	35

ALLOT. NUMBER	SELECTIVE MANAGEMENT CATEGORY	ACRES PUBLIC LAND	LIVESTOCK KIND	GRAZING PERIOD BEGIN-END	CURRENT ACTIVE USE	BLM ACRES BY ECOLOGICAL CONDITION CLASS				
						CLIMAX	LATE SERAL	MID SERAL	EARLY SERAL	UNCLASS/ OTHER
7561	CUSTODIAL	2,616	CATTLE	415-1115	193	0	199	1,945	375	97
7562	CUSTODIAL	40	CATTLE	301- 930	7	3	14	12	11	0
7563	CUSTODIAL	360	CATTLE	416-1130	36	29	122	109	100	0
7564	IMPROVE	3,194	CATTLE	301-1205	198	158	1,258	816	844	118
7565	CUSTODIAL	560	CATTLE	301- 228	53	0	241	150	148	21
7566	CUSTODIAL	40	CATTLE	301- 930	10	3	14	12	11	0
7567	CUSTODIAL	80	CATTLE	415-1014	10	6	27	24	22	1
7568	IMPROVE	2,576	CATTLE	401-1110	82	185	1,504	481	311	95
7569	CUSTODIAL	480	CATTLE	601-1015	42	0	428	34	0	18
7570	CUSTODIAL	120	CATTLE	301- 831	15	10	41	36	33	0
7571	CUSTODIAL	170	CATTLE	301-1118	26	14	58	52	46	0
7572	CUSTODIAL	41	CATTLE	401-1130	7	3	14	12	11	1
7573	CUSTODIAL	80	CATTLE	401- 731	8	6	27	24	22	1
7576	CUSTODIAL	85	CATTLE	401- 930	119	5	22	20	18	0
7577	MAINTAIN	1,534	CATTLE	301- 228	116	0	756	444	278	56
7578	CUSTODIAL	1,804	CATTLE	301- 228	291	78	474	1,092	94	66
7579	MAINTAIN	2,978	CATTLE	915- 228	242	0	1,240	1,243	385	110
7580	CUSTODIAL	162	CATTLE	414-1130	10	0	0	0	156	6
7581	CUSTODIAL	42	CATTLE	501-1001	43	3	14	13	12	0
7582	CUSTODIAL	89	CATTLE	401- 630	7	7	30	27	25	0
7583	MAINTAIN	1,245	CATTLE	301- 228	92	13	179	691	116	46
7584	CUSTODIAL	105	CATTLE	301- 228	11	8	38	32	29	0
7585	CUSTODIAL	300	CATTLE	401- 530	51	0	27	213	49	11
7587	CUSTODIAL	160	CATTLE	301- 630	8	13	54	48	44	1
7588	CUSTODIAL	314	CATTLE	401- 924	35	0	228	74	0	12
7590	CUSTODIAL	40	CATTLE	315- 601	8	3	14	12	11	0
7591	CUSTODIAL	720	CATTLE	401- 707	34	218	0	414	62	26
7592	MAINTAIN	1,167	SHEEP	601- 930	95	94	395	354	324	0
7594	CUSTODIAL	799	CATTLE	301- 228	58	64	271	242	222	0
7596	CUSTODIAL	718	CATTLE	315-1030	28	0	70	221	400	27
	TOTALS	292,736			17,778	22,774	95,978	85,814	78,659	9,511

Appendix F Range Monitoring Studies

An essential part of any grazing management plan involves monitoring to determine if resource objectives are being met. The type(s) of monitoring study(ies) will vary depending on the resource objectives. Here is a brief description of the more common studies used for rangeland monitoring in the Prineville District.

1. Utilization

A livestock use area is examined after grazing to determine the amount of use, expressed as a percent of current year's growth, incurred on plants normally grazed by livestock. The examination can be for a single species or for several species, depending on resource objectives. The study area may consist of one or more transects in the use area or could involve mapping the entire use area to determine livestock grazing patterns.

2. Actual Use

The livestock operator submits a detailed record at the close of the grazing period showing how the allotment was used. Actual use may not correspond exactly to authorized use because of factors such as late turnout, removal of sick animals, fewer total numbers than authorized, and stray animals--either in or out of the allotments.

3. Climate

An index based on crop year precipitation has been developed by the Squaw Butte Field Station and provides a good indicator of forage growth. Records from NOAA weather reporting stations provide adequate coverage for most areas, but site specific studies (i.e., a recording hydrothermograph installed in an allotment) may be used as needed.

These three studies, conducted on a regular basis, monitor major causative agents of change in vegetation and can also be indicative of trends in ecological condition. Three other kinds of studies are also used.

4. Photographic

Color photographs may be taken at locations representative of the allotment. These points are permanently established (using steel posts) and the photos are repeated, usually at three to five year intervals. General change in vegetative composition and/or vigor can be observed with this technique. Aerial photography may also be used and can be particularly valuable in monitoring riparian areas.

5. Population Studies

Methods of sampling plant populations have been developed which result in data of varying statistical reliability. Studies such as nested frequency give an indication of the occurrence of a species at a location. Line intercept and belt transect studies may be used to determine the relative composition and/or cover percentage of each species in a given population. Although they are time consuming and costly, these studies can be used to detect subtle changes in ecological condition of an allotment and to provide a statistical basis for future analysis.

6. Reinventory

Allotments may be reinventoried for ecological condition (seral stage) using the Ecological Site Inventory (BLM Handbook H-4410-1). Ecological condition is normally estimated by comparing an ocular estimate of the relative plant species composition with the standard provided by the appropriate site guide, but detailed measurements may be taken where needed. This is a long term study which will normally be conducted only when other studies indicate that a full condition class of change may have occurred, or when a long enough period of time (perhaps 15 years) has elapsed that it is considered desirable to update the ecological condition data base.

Appendix G Discussion of Grazing Treatments and Existing/Proposed Systems

Treatments

A grazing treatment is livestock grazing on a pasture at a specific intensity with specific timing in relation to the annual growth cycle of key plant species. General descriptions of grazing treatments are:

Early Grazing--Grazing occurs for one to two months before the start of the critical growth period (April 15/May 1). Livestock are utilizing primarily the previous year's growth, although there is some use of early green growth.

Growing Season Grazing--Grazing occurs during the critical growing period, generally between April 15 and seed ripe for key grass species (July 15/August 1).

Deferred Grazing--Grazing occurs after seed ripe and may include any part of the period until growth begins in the spring.

Winter--Grazing occurs in late fall and winter months while plants are dormant.

Rest--No grazing in the grazing season, excluding any of the listed treatments.

Grazing System

A grazing system may be one or more planned livestock grazing treatments which generate changes in, or maintain composition of key plant species. Key species are plants which serve as indicators of objective accomplishment in vegetation communities. Grazing systems which allow key species to complete the growth stages generally result in increases of, or maintenance of, key species. In the planning area, the critical part of the growing season normally occurs from April 15 to August 1, depending on the elevation.

General descriptions of grazing systems and their effects are:

Early Spring Grazing System--Grazing occurs for one to two months before the start of the critical growing period. Early spring grazing utilizes early maturing grasses that are not as palatable later in the season, such as cheatgrass and Sandberg's bluegrass, and also utilizes the previous year's growth of perennial plants. Because grazing ceases while adequate soil moisture is available, most perennial plants are able to produce seed and replenish their carbohydrate reserves. Early spring grazing would permit seedling establishment. An increase in key upland herbaceous species composition is expected under this sytem.

Light utilization on key upland woody species is expected with early spring grazing. Consequently, a long term increase in composition of these species would occur in areas where potential for increase exists because plant vigor and reproduction would be maintained.

Key woody and herbaceous riparian vegetation would increase with this system. Better distribution of livestock because of cool weather, abundant green upland forage, and more water sources would reduce use on riparian vegetation. Regrowth after grazing would occur because of adequate soil moisture in the riparian areas.

Spring/Summer Grazing System--Grazing occurs every year in the critical part of the growing season under this system. A decrease in native, key upland herbaceous and woody species is expected on areas within an allotment that receive heavy utilization--primarily areas adjacent to water developments, riparian areas and flat valley bottoms.

Livestock prefer green forage. As upland herbaceous species become dry in late summer, livestock start grazing green herbaceous and woody species in accessible riparian areas. Heavy utilization generally occurs.

Deferred Grazing System--The deferred system allows grazing after most of the upland herbaceous key species have reached seed ripe stage and have replenished carbohydrate reserves. The composition of key upland herbaceous species, such as Idaho fescue and bluebunch wheatgrass are expected to increase.

Moderate utilization of upland woody species encourages growth of additional twigs and therefore increases forage production. Reproductive capacity decreases slightly over time because increased twig growth reduces development of flowers and fruits. Long term composition is not expected to change.

Livestock would concentrate in accessible riparian areas because of the availability of green forage and water and the hot late summer temperatures. This concentration results in heavy utilization of riparian herbaceous and woody species. The composition of key woody riparian species would decrease under this system because grazing would occur during the majority of the critical growth period for these species, particularly willow. Herbaceous riparian species composition would not change because deferred grazing would allow sufficient plant growth to sustain root reserves.

Winter Grazing System

The winter system provides total growing period rest every year since grazing occurs only between complete plant dormancy and the start of spring growth. Plant vigor, seed and root production, and seedling establishment are promoted. Dormant woody riparian species are utilized to some degree, and therefore live twig growth is removed. However, winter use benefits riparian vegetation since use of riparian areas is low due to an abundance of livestock water elsewhere. Cold air in the drainages also discourages livestock use of riparian zones.

Deferred Rotation Grazing System--Under deferred rotation, one or more years of grazing use in the critical growing period are alternatives with a year or more of grazing after the seeds of the key herbaceous species ripen and carbohydrate reserves have been stored. At moderate utilization levels, this system would allow adequate root storage and an increase in key herbaceous species would occur. Under heavy utilization levels, root storage in the year of deferment would be adequate only to offset depletion that would occur during the year of season long use. Herbaceous key species composition would not be expected to change. Woody key species composition in upland areas would not change under moderate utilization and would decrease at heavy utilization levels unless there are at least two years between deferred treatments.

The composition of woody species in riparian areas would decrease under this system if deferred treatment is used in alternate years. However, if two or more years pass between deferred treatments, woody riparian species would be maintained. Concentrations of livestock in riparian areas would result in heavy utilization of woody riparian species in their critical growth period. Benefits from rest periods for herbaceous riparian species would be offset by impacts from the periods of use and the composition would remain unchanged.

Rest Rotation Grazing System--Rest rotation grazing alternates one or more years of complete rest with other grazing treatments. The length of the rotation cycle and the number of grazing treatments depend on the number and size of pastures in the grazing system. Three common rest rotation systems are:

Rest rotation alternates one year of spring/summer grazing with one year of rest. Herbaceous and woody upland species would not change in composition at heavy use levels because the year of rest provides a recovery period from the year of summer long utilization. At light or moderate utilization levels, these species would increase in composition. Riparian key species composition would be maintained at existing levels because the heavy utilization made on these plants in summer long grazing would be offset by the year of rest.

A second type of rest rotation alternates one year of grazing after seed ripe and one year of complete rest. Under this system, upland herbaceous key species would not be grazed in the critical growing period, resulting in improved vigor, increased seed production, and seedling establishment which would increase key species composition.

Another, more complex system, rotates a growing season treatment with a deferred treatment, followed by complete rest. Under this system upland herbaceous key species are grazed only one of three years in the critical growing period and therefore will increase in composition. Woody riparian species are not improved since the total rest treatment is offset by one to two years of grazing.

These are examples of the more common systems. Combinations of the treatments can be incorporated depending on the needs of the plants, livestock management, topography, and so forth.

Grazing Systems to be Considered Under Alternative A

For all allotments containing manageable blocks of public land (for the most part, I and M allotments) where existing management is not in place, where riparian management is not an issue, or where riparian zones can be economically fenced, systems which promote vigor and reproduction of key upland species will be considered. Depending on the resource objectives, this could include all systems mentioned above, except spring/summer.

If riparian management is an issue and the riparian areas cannot be economically fenced, winter and early spring grazing systems will be required for these areas to promote vigor and re-establishment of both herbaceous and woody riparian vegetation, as well as all upland species. If these systems cannot be implemented, the pasture(s) will be excluded from grazing.

For all allotments containing scattered, unmanageable tracts of public land (generally the C allotments) a deferred rotation system with at least one year of deferment for every three years of use will be required to insure at least maintenance of existing plant composition and in most cases will result in increased composition of upland herbaceous vegetation.

Grazing Systems to be Considered Under Alternative B

The grazing systems would be the same as Alternative A, except, where riparian areas cannot be fenced, they will be managed in conjunction with the grazing system designed to improve the composition of the associated upland vegetation.

Grazing Systems for Alternative C

With the exception of a few allotments utilizing deferred rotation, early spring, or deferred grazing, the most popular system is spring/summer.

Grazing Systems to be Considered Under Alternative D

Under Alternative D the systems would be the same as Alternative A except many of the allotments in the river canyons, and within important wildlife areas, would be excluded from livestock grazing and would therefore receive a rest treatment every year.

Grazing Systems to be Considered under Alternative E

The rest treatment would apply to all public land under Alternative E.

Grazing Systems and Wildlife Habitat Diversity

Rest rotation and deferred rotation grazing systems would increase herbaceous ground cover for nesting waterfowl, upland birds, and nongame species. There would be a reduction of residual cover for nesting waterbirds along shorelines or reservoirs one year during the grazing cycle.

Species dependent on bunchgrass would increase. Deferred rotation would increase forage quality and availability for spring use by big game species by removing standing litter. Rest rotation systems would rotate early use between pastures, eliminating seasonal competition in each pasture every year. Rest rotation and deferred rotation would increase forage for big game. Early spring, spring/summer, and winter systems would result in forage competition between big game and livestock each year in the same pasture.

Exclusion of livestock would change ecological condition. It would approach late seral ecological condition, improving habitat for nongame species. Waterfowl use would increase when exclusion areas are adjacent to water.

Appendix H Design Standards and Standard Operating Procedures for Range Developments

Range Developments

The following is a discussion of typical design features and construction practices for range developments and treatments proposed in this RMP/EIS. They include many special features that can be a part of a project's design which are not discussed specifically in this Appendix. One example of a special design feature is the use of a specific fence post color to blend with the surrounding environment, mitigating some visual impact of the fence. These design features could be developed for individual projects at the time an environmental analysis is completed.

Structural Developments

Fences

Fences are constructed to provide exterior allotment boundaries, divide allotments into pastures, protect streams and riparian zones, and to control livestock. Most fences are three or four wire strands strung between steel posts and with intermediate wire stays. Fence lines are not bladed or scraped. Gates or cattleguards are installed where fences cross existing roads. All fences are designed to mitigate wildlife movement problems.

Spring Developments

Where natural springs exist, standard operating procedure calls for development to provide a more dependable source of water for livestock and wildlife while protecting the source from trampling. In the major canyons the springs can improve livestock distribution by pulling cattle from the canyon bottoms, allowing use of previously unused rangeland. These developments will permit grazing systems which would allow periods of rest or deferment of livestock grazing.

Springs are developed by hand labor or backhoe to install a buried collection system. A short pipeline may be installed to deliver water to a trough. Ramps, rocks or flatboards are installed in all water troughs to allow small birds and mammals to gain access to and/or escape from the water. Normally the spring area and the overflow is fenced after development to exclude livestock.

Some spring developments would cause a permanent change in ecological condition on five to 10 acres surrounding the water source because of heavy utilization and trampling by livestock concentrating in the area. As springs are developed, water would be diverted to livestock water troughs, and fencing would protect riparian vegetation where significant overflow occurs. An increase in booth woody and herbaceous riparian key species would occur in the long term at the springs.

Nonstructural Developments (Land Treatment)

Vegetation Manipulation

Vegetation manipulation (sagebrush control and sagebrush control with seeding) is used in the big sagebrush vegetation type where significant improvement in ecological condition as a result of grazing management would require more than 20 years.

Sagebrush control projects are designed using irregular patterns and untreated patches to provide for optimum edge effect for visual and wildlife considerations. Layout and designs are coordinated with the Oregon Department of Fish and Wildlife.

Burning to achieve sagebrush control reduces big sagebrush and increases shrubs such as rabbitbrush and snakeweed. The effect of burning on perennial bunchgrasses varies with the intensity of the fire, season of the burn and the species of grass in the burn area. In general, the composition of bunchgrasses would increase on areas proposed for burning and a change of at least one ecological condition class would be expected.

Seeding

Seeding is done with a rangeland drill. The planting mix is crested wheatgrass with other species added as a benefit to wildlife. Burning prepares land for seeding. Species composition after seeding would vary according to the success of the brush control, the survival of other species in the seed mixture, and the amount of precipitation in the year after seeding.

The existing road and trail system provides access for range developments and normal maintenance such as replacement of fence posts, and retreatment of vegetation manipulations.

Standard Operating Procedures

In addition to guidance common to all alternatives (Chapter 2), these procedures would be followed in construction of all management facilities and for vegetation manipulations:

1. All actions would be consistent with the BLM's Visual Resource Management criteria. The management criteria for the specific visual class would be followed.

2. In crucial wildlife habitat (winter ranges, fawning/calving areas, curlew nest areas and so forth), construction work would be scheduled during appropriate season to avoid or minimize disturbances. In addition, wildlife needs would govern the size and design of the projects.

3. Surface disturbance at all project sites would be held to a minimum. Disturbed soil would be rehabilitated to blend with surrounding soil surface and would be reseeded as needed with a mixture of grasses, forbs, and browse to replace ground cover and reduce soil loss from wind and water erosion.

4. Analysis of cost effectiveness would be finished on an Allotment Management Plan (AMP) basis before installation of any management facility or land treatment.

5. All areas where vegetative manipulation occurs would be totally rested from grazing for at least two growing seasons after treatment.

6. No BLM action would be taken that could jeopardize the continued existence of any Federally listed threatened or endangered plant or animal species. An endangered species clearance with the U.S. Fish and Wildlife Service (FWS) would be required before any part of the Preferred Alternative or other alternatives would be implemented that could affect an endangered species or its habitat.

In situations where data are insufficient to make an assessment of proposed actions, surveys of potential habitats would be made before a decision is made to take any action that could affect threatened or endangered species. Should the BLM determine there could be an effect on a Federally listed species, formal consultation with the USFS would be initiated. Before formal consultation, the BLM would not take any action that would make an irreversible or irretrievable commitment of resources that would foreclose consideration of modifications or alternatives to the proposed action. If the FWS opinion indicates the action would be likely to jeopardize continued existence of a listed species or result in destruction or adverse modification of critical habitat, the action would be abandoned or altered as necessary.

Appendix I Standard Operating Procedures for Forest Practices

Roads

Oregon Manual Supplement, Release 5-115 of April 10, 1975 would be used in preparing road construction requirements for timber sale contracts. Engineering terminology and types of construction equipment are defined in the manual supplement and specifications are provided for all aspects of construction, reconstruction, and surfacing.

Slope protection methods to avoid collapse of cut and fill embankments are described. Specifications for rock pits and quarries include provisions for minimum visual intrusion, drainage and control of runoff, and restoration after the activity ends.

One section of the manual supplement provides design features to control and minimize erosion during road construction and throughout the design life of the road. Another section addresses soil stabilization practices, including planting, seeding, mulching, and fertilizing to establish soil binding vegetation.

Construction standards in areas such as stream crossings, subgrade width, cut and fill slope requirements, and type of surfacing, would be determined in the timber sale planning process. Basic construction operations are described in detail in the programmatic environmental impact statement the BLM prepared on timber management in the western United States (USDI) (BLM 1975), referred to as the BLM Timber Management FEIS. Road closures would occur where significant impacts to wildlife may result from uncontrolled vehicle access.

Timber Harvest

Cutting areas would be shaped and designed to blend as closely as possible with natural terrain and landscape, minimizing the effect on total forest vistas. Consideration will be given to future harvesting, impacts of road construction and other relevant factors.

Silvicultural practices would be used which best meet management goals, and related land use prescriptions and assure prompt forest regeneration. Available harvest options include clearcutting or a variety of partial cutting techniques.

Clearcutting would not be used as a cutting practice where:

1. Soil slope or other watershed conditions are fragile and subject to unacceptable damage;

2. There is no assurance that the area can be adequately restocked within five years of harvest;

3. Aesthetic values outweigh other considerations.

The selection of trees in partial cuts would be made in a manner to improve the genetic composition of the reforested stand. Cut over areas would be artificially reforested when natural regeneration of commercial species cannot be reasonably expected in five to 15 years.

Logging activities would be timed to minimize adverse impacts to other resource values.

Logging systems which least disturb the soil surface and streamside buffer strips are preferred. Logging across any stream supporting fisheries would be avoided.

Tractor skid trails would be designed and located to avoid cross ridge and cross drainage operations. Tractor skidding would be avoided on slopes greater than 35 percent. Maximum acceptable soil compaction within a sale area would be 12 percent. Waterbars would be installed on skid trails when logging is finished.

Landings would be the minimum size commensurate with safety and equipment requirements and located on stable areas to minimize the risk of material entering adjacent streams and waters. Landings would be on firm ground above the high water level of any stream. Landing locations would be avoided on unstable areas, on steep side hill areas or areas which require excessive excavation.

Buffer strips along perennial streams, springs, and wet meadows would be provided. Intermittent streams producing enough flow for trout or anadromous fish spawning areas or which carry heavy silt loads to perennial streams, would receive the same considerations as a perennial stream.

Debris entering a stream would be removed while logging to avoid disturbing natural streambed conditions and streambank vegetation.

Evenly distributed management would be provided for creatures that live in tree cavities if safety hazards are not created and decisions on the allowable cut plan are not violated.

Slash disposal would be accomplished in a manner conducive to reforestation and advantageous to wildlife. Slash would be burned when necessary, in conformance with state fire protection and air pollution regulations.

Contracts

Contracts, usually awarded on a competitive basis, is the way all timber harvest and many forest development practices are accomplished. Standard and special provisions (which include mitigating measures) in a contract describe performance standards for the contractor in carrying out the action in accordance with applicable laws, regulations, and policies. The selection of special provisions is governed by the scope of the action to be undertaken and the physical characteristics of the specific site. The standard provisions of the basic timber sale contract, Bureau Form 5450-3, are applicable for all timber sales. Limitations on timber harvesting and related activities, as identified in the Church Report (U.S. Congress, Senate 1973) and analyzed in the BLM Timber Management Final EIS 1975, have been adopted by the BLM. Bureau manuals and manual supplements provide a variety of approved special provisions for use, as appropriate, in individual contracts. The combination of selected special provisions constitutes Section 41 of the timber sale contract (Form 5450-3).

Appendix J Potential Land Disposal Tracts in Zone 3

Township	Range	Section	Subdivisions	Acreage
1 N.	18 E.	24	ENE,SWNE	120.00
		25	NWNE	40.00
		26	SENW,NESW	80.00
	19 E.	19	L2	57.37
	22 E.	20	SNE,SE	240.00
		28	NNE	80.00
		34	SWNW	40.00
1 S.	20 E.	21	E	320.00
		32	SENE,ESE	120.00
	21 E.	13	SESW	40.00
10 S.	17 E.	12	SWNE	40.00
		2	SWSE	40.00
	18 E.	1	NESW	40.00
		10	NENE,NWSE	80.00
		14	NWNE,NNW	120.00
		18	L1,3,4,SESW	153.33
		27	SWSW	40.00
		33	NENW	40.00
		6	L5	37.20
	19 E.	11	WSW,SESW	120.00
		21	NWNE,NENW	80.00
		4	ESE,L2-4,SNW	282.58
	20 E.	17	SWSW	40.00
		18	SWNE,ENW	120.00
		7	L4	39.93
	21 E.	25	SWSE	40.00
	22 E.	1	L2,3	80.80
		3	SWNE,SWNW	80.00
		30	SWNW,NSW	121.00
		41	SWSW	40.00
		9	NWNW	40.00
	23 E.	1	L2	40.37
		25	SESW	40.00
		28	SESW,WSE	120.00
		30	L3,4	81.36
		32	NESE	40.00
		33	NNE,SWNE,NNW, SENW,NS	400.00
		4	L4	39.42
	24 E.	10	SWNE,NWSE	80.00
		11	NENE	40.00
		12	SWNW	40.00
		15	NSW	80.00
		17	WSW	80.00
		19	SWNE	40.00
		2	L2-4,SENW	163.91
		20	NWNW	40.00
		22	SSE,NESE	120.00
		23	SWSW	40.00
		27	SENE	40.00
10 S.	24 E.	29	SSW	80.00
		3	L1	41.19
		31	ENW,NESW	120.00
		32	SENW,SWSW	80.00
		4	L4,SSE	120.83
		5	L1-3,SWNE	161.71
		6	SESW	40.00

Two Rivers Zone 3 Acreages

Township	Range	Section	Subdivisions	Acreage
		7	ENW	80.00
		8	SENW,NESW	80.00
11 S.	20 E.	24	L14	50.90
		26	SENE,NWNW, SESE	120.00
		27	NENE,SESW	80.00
		26	NENE	40.00
	21 E.	22 E.	1	SENE	40.00
			18	SS	161.02
			28	SESW,ESE,SWSE	160.00
			30	NN	160.69
		23 E.	17	NWNE,NENW	80.00
			26	SWSE	40.00
			27	NSW,NWSE	120.00
			35	NWNE	40.00
			7	L4	41.76
		24 E.	10	NWNW	40.00
			12	SSW	80.00
			13	NENE,NNW	120.00
			14	SWNE,SENW,SW, NWSE	280.00
			15	SESE	40.00
			19	SESE	40.00
			21	NENW	40.00
			24	ENE,NESE	120.00
			30	L2,3,ENW	154.25
			31	SSE	80.00
			32	SESW,SSE,NESE	160.00
			33	SSW	80.00
			35	NWSE	40.00
			6	L5	38.30
			9	SESW	40.00
12 S.	20 E.	1	L6	50.90
	21 E.	10	SWNE	40.00
		17	SWSE	40.00
		20	NWNE,NENW	80.00
		3	SESE	40.00
	22 E.	10	ESE	80.00
		14	NNW	80.00
		2	SWSW	40.00
	23 E.	1	L1	39.95
	24 E.	10	WNE,SNW	160.00
		2	NESE	40.00
		4	L2-4	124.35
		5	L2-4	123.34
2 N.	16 E.	10	L2	20.00
		9	L1,2	88.70
	20 E.	24	NE	160.00
2 S.	19 E.	11	SWNE,NWSE	80.00
		25	NWNE	40.00
		34	SENE,NESE	80.00
		8	SWNE,NESW	80.00
	20 E.	25	SESE	40.00
	21 E.	29	L8	38.94
		30	L7-10	156.05
		31	L12,13,9,16	158.06
		32	L10,9	79.44

Two Rivers Zone 3 Acreages

Township	Range	Section	Subdivisions	Acreage
		33	SSW	80.00
		35	SWSW	40.00
		6	NSE,SWSE	120.00
3 N.	20 E.	32	L2-4,S2,NE	145.00
3 S.	18 E.	31	L3,4,SESE	111.92
	19 E.	1	NWSW	40.00
		10	SESE	40.00
		11	SESW	40.00
		21	SSW	80.00
		28	NNW	80.00
		29	SESE	40.00
	20 E.	11	NENE	40.00
		2	L3,SWSE	79.68
	21 E.	13	NENE,NESE	80.00
		6	SESW,WSE	120.00
		7	NWNE	40.00
		9	WW	160.00
	22 E.	19	NWNE	40.00
		30	SWSE	40.00
4 S.	17 E.	1	SENW	40.00
	18 E.	18	L1,2,NENW	112.56
		27	SESW	40.00
		34	ENE,NSW,SSE, NESE	280.00
		35	SWSW	40.00
		5	SWNE,NSW	120.00
		6	L1,SENE,NESE	119.77
	19 E.	13	SSE	80.00
		18	NENW	40.00
		24	NWNE	40.00
	20 E.	15	SESE	40.00
		22	ENW,NESE	120.00
		35	NWNW	40.00
	22 E.	3	NESE	40.00
		32	SWSW	40.00
	23 E.	15	SW	160.00
		20	NWSW	40.00
		22	NWNW,SWNE	80.00
		28	NWSW	40.00
		31	L3,NESW,SENE	120.02
		33	SENW	40.00
5 S.	18 E.	20	SWSW	40.00
		9	SWSE	40.00
	19 E.	15	SWSE	40.00
		24	NWNW	40.00
	20 E.	10	NN	160.00
		19	L3	40.41
5 S.	20 E.	3	SWSW	40.00
	21 E.	6	L3,SENW	80.00
	22 E.	11	SENE	40.00
		12	NWSW	40.00
		34	SENE	40.00
		4	NESW	40.00
	21 E.	10	ESW	80.00
		11	NENE,SENW, SESW,WSE	200.00
		12	WW	160.00
		13	NWSW	40.00
		14	SWSE	40.00
		15	ENE,SWNW, SESW,SWSE	200.00

Two Rivers Zone 3 Acreages

Township	Range	Section	Subdivisions	Acreage
		31	SWNE	40.00
		35	NENW	40.00
	24 E.	1	SWSE	40.00
		10	SWNW,NESW	80.00
		3	SENE	40.00
6 S.	17 E.	12	NNE	80.00
	18 E.	27	SWNE,SENW, NSW	160.00
		32	NSW,SESW	120.00
		6	L3,ESW	120.56
	19 E.	3	NESW,SSE	120.00
	23 E.	12	NENW	40.00
		23	NESW	40.00
	24 E.	1	L2	27.25
		10	NESW	40.00
7 S.	17 E.	14	NN	160.00
		2	L3,SENW	80.04
		24	EE	160.00
	18 E.	32	NSW,SWSW, NESE	160.00
	19 E.	10	SESW,WSE	120.00
		13	SNE	80.00
		14	SWSW	40.00
		15	WE,NENW,ESE	280.00
		22	NNE,SS	240.00
		23	NWSE	40.00
		24	SESE	40.00
		25	ENE,SWSW,NESE	160.00
	20 E.	19	L2,SWNE,SESW	126.89
		20	SESW,SSE	120.00
		21	SSW	80.00
		28	SWNW	40.00
		29	NWNW	40.00
		32	SWNE,NSE,SWSE	160.00
		33	SSE	80.00
	21 E.	19	SESW	40.00
	22 E.	12	NWNE,L3	74.10
		14	NWSE	40.00
		20	SWNE	40.00
		23	NWSW	40.00
		25	NENE,SNW	40.00
		26	SNE,SESE	120.00
		34	NESW	120.00
8 S.	18 E.	11	SESW	40.00
	20 E.	11	SENE	40.00
		12	L2,3	111.28
		8	WSE	80.00
		9	L3	33.92
	21 E.	14	L5	38.41
		20	NWSE	40.00
		5	L1	28.22
	22 E.	1	L1,3,5	111.48
		10	L4	36.58
		11	SESW	40.00
		26	L1,2,WSE,SESE	190.28
		34	NESE	40.00
		35	NNE	80.00
		4	SENW	40.00
		6	SESW	40.00
		7	L6,NENW	81.19

Two Rivers Zone 3 Acreages

Township	Range	Section	Subdivisions	Acreage
	23 E.	23	NWNE	40.00
		26	SESW	40.00
		3	L2,SENW	78.79
		35	NWNE,NENW, SESE	120.00
		9	SSW	80.00
	24 E.	10	NWSW	80.00
		17	SWSW	40.00
		21	NWSE,SESE	80.00
		23	ESW,WSE,NESE	200.00
		25	SWNE	40.00
		27	NWNW	40.00
		28	NENE	40.00
		29	SESW	40.00
		30	NESW	40.00
		5	SESW	40.00
		8	ENW,SWNW	120.00
	25 E.	19	L4	39.49
		2	SESW	40.00
		20	SE	160.00
		22	SWSE	40.00
		27	SWNW,WSW	120.00
		28	SENE,SE	200.00
		29	NNE,SWNE,NENW	160.00
		3	SWNE,NESW,NSE	160.00
		30	L1	39.56
		33	NWNE	40.00
		35	SWNE,SENW	80.00
		7	NESW	40.00
9 S.	17 E.	13	NWSW	40.00
		14	SESE	40.00
	18 E.	20	SENE,NESE	80.00
		21	ENW,SWNW, NWSW	160.00
		8	SESE	40.00
		9	SSE	80.00
	19 E.	26	ESE	80.00
		34	SESW,SE	200.00
	21 E.	12	SENW,SESW, WSE,NESE	200.00
		13	NW,NSW	240.00
9 S.	21 E.	14	SENE	40.00
		18	L2,SENW	77.09
		19	SENE,SWSE	80.00
		22	ENE,SWNE,NESE	160.00
	22 E.	7	L1-3,NENW	185.23
	23 E.	13	SENE,ESE	120.00
		24	NENE	40.00
		25	NESE	40.00
		31	L4,SESW	95.17
		32	SESE	40.00
		33	NWNE,ENW, SWNW,WSW	240.00
	24 E.	12	SWSE	40.00
		14	NESE	40.00
		17	NWNE	40.00
		18	L3	38.95

Two Rivers Zone 3 Acreages

Township	Range	Section	Subdivisions	Acreage
		22	NWNE	40.00
		23	SNE,NESW	120.00
		24	NWSW	40.00
		25	SW,ESE	240.00
		26	NWSW	40.00
		27	SESW	40.00
		28	NESW	40.00
		29	NSW	80.00
		30	L3,NESW	79.01
		33	WNE,SENW	120.00
		34	NENW,SESE	80.00
		35	SENE,SSW,SE	280.00
		8	SESE	40.00
	25 E.	12	SENE	40.00
		19	L1,2,4,NENW	183.34
		21	NSE	80.00
		30	L4,SESW	87.85
1 N.	11 E.	18	NENE	40.00
	12 E.	11	SESE	40.00
		35	NESE	40.00
1 S.	10 E.	21	NESW,ESE	120.00
		9	ESE	80.00
	11 E.	13	SESE	40.00
	12 E.	1	NWSE	40.00
		17	NWNE	40.00
		19	L2	37.73
		31	SNE,NESW,NSE	200.00
		32	SWNW,NWSW	80.00
	13 E.	6	L2,3	77.38
		7	SESE	40.00
10 S.	13 E.	1	L1	40.05
	15 E.	11	WNE,NENW	120.00
		17	NWSW	40.00
		2	L2-4,SESW	158.31
		22	SWNW,NWSW	80.00
		30	NENE	40.00
		33	SWNE	40.00
10 S.	16 E.	7	L2	40.67
11 S.	13 E.	6	SWSE	40.00
	14 E.	25	SWNW	40.00
		32	NESW	40.00
	15 E.	10	NWNE	40.00
		3	SSW	80.00
		31	NWSE	40.00
		4	SESE	40.00
		5	L1	34.00
12 S.	15 E.	18	NWNE	40.00
		19	SESW	40.00
		28	SWNW	40.00
		29	NESE	40.00
2 N.	10 E.	32	NSW	80.00
	11 E.	8	SWSW	40.00
	12 E.	32	NESENE	10.00
		33	NWNE	40.00
	15 E.	16	SSW,SSWSE	60.00
		7	L1	0.22
	16 E.	18	L5	50.52
2 S.	12 E.	20	NENW	40.00
3 S.	13 E.	14	NESE	40.00

Two Rivers Zone 3 Acreages

Township	Range	Section	Subdivisions	Acreage
		24	NESE	40.00
		7	L3	38.81
4 S.	13 E.	10	NWSW	40.00
		18	NENW	40.00
5 S.	11 E.	35	L4	36.03
	13 E.	14	SENW,L3,NESW	103.85
		15	L1,NSE,SWSE	158.97
		22	L2	37.50
		33	L3,4	60.27
	14 E.	10	SESE	40.00
14	NESE	40		
		.00		
		35	NWSW	40.00
	16 E.	10	NESW	40.00
		22	SWNE	40.00
		23	SENE	40.00
		25	SWSE	40.00
		34	NESW,SWSE	80.00
6 S.	13 E.	10	SSW	80.00
		15	L1-4,SW,NSE,SW-SE	429.61
		16	NSW,NWSE	180.00
		4	L1,2,NWSW	120.00
		5	SENW	40.00
		6	S2 Lot 6	12.00
		8	N,NWSE	360.00
		9	EE	160.00
	16 E.	1	NESW,NWSE	80.00
		10	NESW	40.00
		11	NENW	40.00
		12	NNE,NESE	120.00
		13	NENW,SNW	120.00
		17	NWNE	40.00
		2	SWNE,SESE	80.00
6 S.	16 E.	20	SESE	40.00
		23	WNW	80.00
		27	NNW	80.00
		28	NENE	40.00
		29	NENE	40.00
		3	L2,3,SENE	134.31
		31	L1,2,SWSE	120.43
		33	SENE,SWSW	80.00
		4	NESE	40.00
	17 E.	10	SWSW	40.00
		6	L3,5,6	112.28
7 S.	15 E.	12	NWSW	40.00
		25	NESE	40.00
		31	L1	32.23
		32	NWSE	40.00
	16 E.	15	NNE,NENW	120.00
		20	SWNE	40.00
		21	NWNE,NENW	80.00
		25	SENW	40.00
		29	NWSE	40.00
		31	SENE	40.00
		5	L1,SWNE,SENW	119.28
	17 E.	20	NWNW,NWSW	80.00
		34	SENE	40.00
		8	SESW,SE	200.00

Two Rivers Zone 3 Acreages

Township	Range	Section	Subdivisions	Acreage
8 S.	15 E.	1	L1,2,SENE,NESE	160.30
		11	SWNW	40.00
		15	NWSE	40.00
		2	SESW	40.00
		7	L3,4	78.90
	16 E.	1	SWNW	40.00
		14	NWSW	40.00
		19	SENW	40.00
		8	NESE	40.00
		9	NWSW	40.00
	17 E.	17	NWSE	40.00
		32	NENW	40.00
		33	NWNW	40.00
9 S.	13 E.	25	SSE	80.00
	14 E.	15	ESE	80.00
		22	NWNE,SENE,ES-W,ESE,SWSE	280.00
		23	SWSW	40.00
		26	NWNE	40.00
		27	SENE	40.00
		30	L2,SENW	82.42
	15 E.	1	SESE	40.00
		14	SWSE	40.00
		15	NENE	40.00
		2	SWSW	40.00
		30	NWSE	40.00
	16 E.	16	NESW	40.00
		6	L7,SESW	81.88

Appendix K. Initial and Predicted Long Term Livestock Forage Use

NO.	ALLOTMENT NAME	ACRES PL	CURRENT ACTIVE USE	CATEGORY	SHORT TERM A	LONG TERM A	SHORT TERM B	LONG TERM B	SHORT TERM C	LONG TERM C	SHORT TERM D	LONG TERM D
					SHORT TERM AND LONG TERM FORAGE USE (AUMS) ALTERNATIVE							
2500	FRANK ANDERSON	80	10	CUSTODIAL	10	10	10	10	10	10	10	10
2501	ASHER, HERBERT	1,999	101	IMPROVE	101	140	125	200	101	101	70	125
2502	BRUSH CREEK	280	35	CUSTODIAL	35	35	35	35	35	35	35	35
2503	ASHER, HUBERT	360	17	IMPROVE	17	22	17	30	17	17	17	17
2504	BARKER	160	18	CUSTODIAL	18	18	18	18	18	18	18	18
2505	BARNETT	400	55	CUSTODIAL	55	55	55	55	55	55	55	55
2506	MAXINE BARNETT	200	19	CUSTODIAL	19	19	19	19	19	19	19	19
2507	BROOKS	120	9	CUSTODIAL	9	9	9	9	9	9	5	5
2508	BEAR CREEK	842	45	MAINTAIN	45	45	45	45	45	45	45	45
2509	BELSHE	1,840	62	IMPROVE	62	70	85	110	62	62	18	30
2510	BIG MUDDY	14,890	605	IMPROVE	605	900	850	1,800	605	605	460	750
2513	BIG SKY	1,215	60	MAINTAIN	60	60	60	110	60	60	40	70
2514	BLACK ROCK	3,325	224	MAINTAIN	224	262	280	320	224	224	224	248
2515	DONALD R. JOHNSON	280	9	MAINTAIN	9	9	9	9	9	9	5	5
2517	BORSCHOWA	119	6	CUSTODIAL	6	6	6	6	6	6	6	6
2518	PINE CREEK	5,418	346	IMPROVE	346	400	500	600	346	346	207	240
2519	BIG SUMMIT EAST	1,301	149	MAINTAIN	149	149	149	200	149	149	149	149
2520	BOYNTON	2,598	93	IMPROVE	93	93	130	170	93	93	0	0
2521	HORSESHOE BEND	737	43	IMPROVE	43	43	43	60	43	43	0	0
2522	JAMES BROWN	2,527	66	IMPROVE	66	66	66	80	66	66	13	13
2523	BUCK	130	2	CUSTODIAL	2	2	2	2	2	2	2	2
2524	JACK CAMPBELL	441	10	CUSTODIAL	10	10	10	10	10	10	10	10
2525	ROCK CREEK	2,074	231	MAINTAIN	231	231	231	231	231	231	150	152
2526	PETER CAMPBELL	760	60	CUSTODIAL	60	60	60	60	60	60	38	38
2528	W.I. CHAPMAN	1,240	44	CUSTODIAL	44	44	44	44	44	44	20	20
2529	F.C. CHERRY	3,460	304	CUSTODIAL	304	304	304	304	304	304	200	200
2530	CIMMIYOTTI	712	118	CUSTODIAL	118	118	118	118	118	118	50	50
2531	CIRCLE BAR	5,294	192	MAINTAIN	192	230	192	275	192	192	192	210
2532	T. COLE	1,833	102	CUSTODIAL	102	102	102	102	102	102	75	75
2533	SUTTON MOUNTAIN	6,995	403	MAINTAIN	403	490	403	540	403	403	391	425
2534	COLLINS RANCHES, INC.	80	6	CUSTODIAL	6	6	6	6	6	6	6	6
2535	HAYFIELD	345	11	CUSTODIAL	11	11	11	11	11	11	0	0
2536	SPRING BASIN	5,219	45	IMPROVE	45	300	250	375	45	45	175	250
2537	DAVIS	1,260	72	IMPROVE	72	85	72	100	72	72	60	70
2538	DECKER	2,999	206	IMPROVE	206	230	250	280	206	206	46	70
2539	DORMAIER	109	14	CUSTODIAL	14	14	14	14	14	14	14	14
2540	PERSIMMON WOODS	40	5	CUSTODIAL	5	5	5	5	5	5	5	5
2541	EAKIN	1,760	12	IMPROVE	12	12	40	40	12	12	1	1
2542	BIG SUMMIT	970	133	MAINTAIN	133	133	133	133	133	133	133	133
2543	ELLSWORTH	983	32	CUSTODIAL	32	32	32	32	32	32	32	32
2544	CIRCLE S RANCH	518	9	IMPROVE	9	9	25	35	9	9	5	5
2545	FORREST SOLOMON	11,095	438	IMPROVE	438	510	438	650	438	438	438	480
2546	GREEN	40	2	CUSTODIAL	2	2	2	2	2	2	2	2
2547	GRIFFITH	2,397	245	IMPROVE	245	245	245	300	245	245	120	200
2548	HOGAN CREEK	160	12	CUSTODIAL	12	12	12	12	12	12	12	12
2549	HARDIE	1,002	84	MAINTAIN	84	95	84	110	84	84	60	60
2550	FRED HANSON	200	25	CUSTODIAL	25	25	25	25	25	25	15	15
2551	CLINTON O. HARRIS	1,846	98	IMPROVE	98	110	98	130	98	98	70	90
2552	BUCKHORN	40	2	CUSTODIAL	2	2	2	2	2	2	2	2
2553	HIGLEY	1,127	20	IMPROVE	20	25	20	30	20	20	12	18
2554	CHARLES H. HILL	2,557	120	IMPROVE	120	120	120	150	120	120	0	0
2556	MURRAY HOWARD	1,045	43	IMPROVE	43	50	43	75	43	43	29	35
2557	HULDEN	160	15	CUSTODIAL	15	15	15	15	15	15	15	15
2558	HUMPHREYS BROTHERS	5,741	352	IMPROVE	352	400	425	475	352	352	352	360
2559	FOPIANO	762	86	CUSTODIAL	86	86	86	86	86	86	86	86
2560	BASE LINE	598	30	MAINTAIN	30	30	30	30	30	30	30	30
2561	JACKSON	587	61	IMPROVE	61	75	61	90	61	61	30	45
2562	J BAR S	115	4	IMPROVE	4	4	4	6	4	4	4	4
2563	DONALD R. JOHNSON	1,082	63	MAINTAIN	63	75	63	90	63	63	63	70
2564	DONALD R. JOHNSON	325	28	MAINTAIN	28	30	28	35	28	28	28	28
2565	LEROY A. BRITT	431	33	CUSTODIAL	33	33	33	33	33	33	20	20
2566	JUSTESON	113	3	CUSTODIAL	3	3	3	3	3	3	3	3
2567	KAISER BROTHERS	1,509	59	IMPROVE	59	75	59	100	59	59	59	68
2568	KEEGAN	618	29	CUSTODIAL	29	29	29	29	29	29	29	29

NO.	ALLOTMENT NAME	ACRES PL	CURRENT ACTIVE USE	CATEGORY	SHORT TERM	LONG TERM	SHORT TERM	LONG TERM	SHORT TERM	LONG TERM	SHORT TERM	LONG TERM
					SHORT TERM AND LONG TERM FORAGE USE (AUMS) ALTERNATIVE							
					A		B		C		D	
2569	ZACK T. KEYS	2,001	71	IMPROVE	71	98	95	120	71	71	46	55
2570	ZACK T. KEYS	1,607	58	IMPROVE	58	75	80	87	58	58	47	57
2571	HORN BUTTE	5,023	836	IMPROVE	836	900	836	1,000	836	836	500	550
2572	LAFFOON AND CARLSON	3,655	85	IMPROVE	85	85	85	120	85	85	16	16
2574	LEAR	200	13	CUSTODIAL	13	13	13	13	13	13	13	13
2575	ANDREW F. LECKIEJR.	55	1	IMPROVE	1	1	1	1	1	1	0	0
2578	LOGAN	2,194	166	CUSTODIAL	166	166	166	166	166	166	125	125
2579	EUGENE LOGAN JR.	840	42	MAINTAIN	42	85	70	100	42	42	42	60
2580	BIG SUMMIT WEST	1,267	145	MAINTAIN	145	170	145	200	145	145	145	190
2581	ELSIE MARTIN	920	22	MAINTAIN	22	22	22	22	22	22	22	22
2582	GRAY PRAIRIE	40	6	CUSTODIAL	6	6	6	6	6	6	6	6
2583	MULKEY	200	15	MAINTAIN	15	15	15	15	15	15	15	15
2584	CATHERINE MAURER	14,683	526	IMPROVE	526	700	526	1,200	526	526	250	350
2585	SEEK PEAK	320	11	CUSTODIAL	11	11	11	11	11	11	11	11
2586	TOM MCDONALD	1,800	70	IMPROVE	70	98	70	135	70	70	70	86
2587	HERBERT F. MCKAY	2,101	78	IMPROVE	78	110	78	160	78	78	78	98
2588	SPUD	808	40	MAINTAIN	40	40	40	40	40	40	40	40
2589	MCQUINN	40	1	CUSTODIAL	1	1	1	1	1	1	0	0
2591	MILLER	1,875	46	IMPROVE	46	55	65	80	46	46	17	25
2592	MARY MISENER	595	51	IMPROVE	51	60	51	66	51	51	40	45
2593	VERNE A. MOBLEY	1,240	133	MAINTAIN	133	133	133	133	133	133	80	80
2594	MOREHOUSE AND ELLIOT	65	3	MAINTAIN	3	3	3	3	3	3	3	3
2595	MORRIS	833	53	IMPROVE	53	65	70	80	53	53	40	50
2596	HOWARD MORTIMORE	120	12	CUSTODIAL	12	12	12	12	12	12	12	12
2597	JOHN T. MURTHA	7,585	227	IMPROVE	227	310	227	420	227	227	95	165
2598	HAY CREEK	1,518	37	IMPROVE	37	45	37	55	37	37	37	37
2599	KENNETH MYERS	160	10	CUSTODIAL	10	10	10	10	10	10	10	10
2600	J. WILLIS NARTZ	935	48	CUSTODIAL	48	48	48	48	48	48	48	48
2601	VICTOR B. NASH	180	14	CUSTODIAL	14	14	14	14	14	14	14	14
2602	ERNEST L. PARSLEY	40	4	CUSTODIAL	4	4	4	4	4	4	4	4
2603	LEE H. PETTYJOHN	360	14	MAINTAIN	14	14	14	14	14	14	14	14
2604	PHILIPPI	1,022	64	MAINTAIN	64	64	64	80	64	64	64	64
2605	E. GLENN POTTER	280	12	CUSTODIAL	12	12	12	12	12	12	12	12
2606	WILLIAM W. POTTER	80	4	CUSTODIAL	4	4	4	4	4	4	4	4
2607	PRYOR FARMS	800	50	MAINTAIN	50	50	50	50	50	50	50	50
2608	RATTRAY A	4,487	163	IMPROVE	163	200	225	280	163	163	90	125
2609	RATTRAY B	1,085	56	MAINTAIN	56	56	56	78	56	56	40	50
2610	RATTRAY C	1,671	29	IMPROVE	29	29	29	50	29	29	0	0
2611	VAN REETMAN	680	25	MAINTAIN	25	25	25	25	25	25	25	25
2612	ARTHUR N. ROBISON	40	1	CUSTODIAL	1	1	1	1	1	1	1	1
2613	FRANK R. ROBISON	200	4	CUSTODIAL	4	4	8	8	4	4	4	4
2614	R AND R ROLFE	1,893	73	IMPROVE	73	100	73	125	73	73	50	65
2615	ROLFE	145	4	CUSTODIAL	4	4	4	4	4	4	4	4
2616	ORVILLE RUGGLES	160	11	CUSTODIAL	11	11	11	11	11	11	11	11
2617	SCHARF	681	26	MAINTAIN	26	26	26	26	26	26	26	26
2618	SID SEALE	12,597	708	IMPROVE	708	780	708	900	708	708	200	250
2620	EVELYN E. SEE	177	3	CUSTODIAL	3	3	3	3	3	3	3	3
2621	EARL A. SMITH	232	35	CUSTODIAL	35	35	35	35	35	35	10	10
2622	ALTA M. SPAULDING	121	7	CUSTODIAL	7	7	7	7	7	7	7	7
2623	STEIWER RANCHES	2,826	174	MAINTAIN	174	190	174	245	174	174	130	140
2624	THOMAS M. STEPHENS	326	7	CUSTODIAL	7	7	14	14	7	7	7	7
2625	DAVID M. STIREWALT	1,340	65	IMPROVE	65	80	65	100	65	65	7	10
2626	J.M. STIREWALT	8,618	469	IMPROVE	469	550	469	575	469	469	450	500
2627	ROBERT W. STRAUB	678	30	CUSTODIAL	30	30	30	30	30	30	30	30
2628	THOMAS F. SUMNER	840	152	IMPROVE	152	175	152	200	152	152	70	100
2629	TATUM	2,899	113	IMPROVE	113	130	113	170	113	113	70	85
2630	TRIPP	80	7	IMPROVE	7	7	7	7	7	7	4	4
2631	DIPPING VAT	1,180	25	MAINTAIN	25	25	25	25	25	25	25	25
2632	LARSON	400	27	CUSTODIAL	27	27	27	27	27	27	27	27
2633	RATTLESNAKE	2,760	167	IMPROVE	167	190	167	230	167	167	147	160
2634	WADE BROTHERS	160	32	CUSTODIAL	32	32	32	32	32	32	10	10
2635	RICHARD FOSTER	299	20	CUSTODIAL	20	20	20	20	20	20	20	20
2636	GEORGE WEEDMAN	343	6	CUSTODIAL	6	6	15	15	6	6	6	6
2637	V.O. WEST	223	15	MAINTAIN	15	15	15	15	15	15	15	15
2638	VIRGIL M. WOELPERN	144	10	CUSTODIAL	10	10	10	10	10	10	10	10
2639	TUBB CREEK	429	50	CUSTODIAL	50	50	50	50	50	50	50	50
2641	JESS L. ROSS	78	3	CUSTODIAL	3	3	3	3	3	3	3	3
2642	MASCALL, LILLIAN C.	4,306	265	IMPROVE	265	315	265	380	265	265	265	265

					SHORT TERM AND LONG TERM FORAGE USE (AUMS) ALTERNATIVE							
					A		B		C		D	
NO.	ALLOTMENT NAME	ACRES PL	CURRENT ACTIVE USE	CATEGORY	SHORT TERM	LONG TERM	SHORT TERM	LONG TERM	SHORT TERM	LONG TERM	SHORT TERM	LONG TERM
2643	CHARLES H. HILL	80	5	IMPROVE	5	5	5	5	5	5	5	5
2644	HI MEADOWS	640	98	MAINTAIN	98	98	98	98	98	98	65	65
2645	CLARK	3,987	152	IMPROVE	152	200	152	250	152	152	152	190
2646	LONEROCK	147	27	CUSTODIAL	27	27	27	27	27	27	15	15
2647	RATTRAY D	1,191	64	IMPROVE	64	75	64	90	64	64	12	15
2648	HARTUNG	540	16	IMPROVE	16	25	16	30	16	16	16	20
2649	RIM	301	3	CUSTODIAL	3	3	3	3	3	3	3	3
2650	FOX CANYON	550	65	MAINTAIN	65	65	65	65	65	65	65	65
2651	BULL CANYON	280	3	CUSTODIAL	3	3	3	3	3	3	3	3
2652	LIGHTHART	40	1	CUSTODIAL	1	1	1	1	1	1	1	1
2653	BROOKS LEASE	36	2	CUSTODIAL	2	2	2	2	2	2	2	2
2654	CROSSROADS	15	1	CUSTODIAL	1	1	1	1	1	1	1	1
2655	NORTON RANCH	356	21	CUSTODIAL	21	21	21	21	21	21	21	21
2656	DRY KNOB	275	7	CUSTODIAL	7	7	7	7	7	7	7	7
2657	BRIDGE CREEK	51	2	CUSTODIAL	2	2	2	2	2	2	2	2
2660	RATTLESNAKE CREEK	260	11	CUSTODIAL	11	11	11	11	11	11	5	5
2661	PEBBLE SPRINGS	320	53	CUSTODIAL	53	53	53	53	53	53	20	20
4076	COTTONWOOD CREEK	260	—	CUSTODIAL	—	—	—	—	—	—	—	—
4131	DAY CREEK	971	—	CUSTODIAL	—	—	—	—	—	—	—	—
4145	TWO COUNTY	3,587	—	CUSTODIAL	—	—	—	—	—	—	—	—
7501	BIRD	4,737	265	IMPROVE	265	265	350	400	265	265	0	0
7503	BORTHWICK	1,615	191	CUSTODIAL	191	191	191	191	191	191	191	191
7505	BEUTHER	160	8	CUSTODIAL	8	8	8	8	8	8	8	8
7507	CLAUSEN	1,760	112	IMPROVE	112	120	112	150	112	112	15	20
7508	CLAYMIER,L	360	48	CUSTODIAL	48	48	48	48	48	48	48	48
7510	CONLEY	120	27	CUSTODIAL	27	27	27	27	27	27	27	27
7511	CONNOLLY	2,494	373	IMPROVE	373	400	373	500	373	373	14	20
7512	CONROY,P.J.	440	45	CUSTODIAL	45	45	45	45	45	45	45	45
7513	CONROY,J	375	48	MAINTAIN	48	48	48	48	48	48	48	48
7514	COOPER	455	27	CUSTODIAL	27	27	27	27	27	27	27	27
7516	GOMES	120	11	CUSTODIAL	11	11	11	11	11	11	11	11
7517	DRIVER	90	6	CUSTODIAL	6	6	6	6	6	6	6	6
7518	DELUDE	1,350	76	IMPROVE	76	76	76	110	76	76	0	0
7519	DICK	740	35	CUSTODIAL	35	35	35	35	35	35	35	35
7520	DULING	197	8	CUSTODIAL	8	8	8	8	8	8	8	8
7521	DURETTE	190	14	CUSTODIAL	14	14	14	14	14	14	14	14
7523	WHITE RIVER ODFW CMA	265	0	CUSTODIAL	0	0	0	0	0	0	0	0
7524	FESSLER	213	25	CUSTODIAL	25	25	25	25	25	25	25	25
7525	FOLMSBEE	500	21	CUSTODIAL	21	21	21	21	21	21	21	21
7526	FORMAN,C	400	38	CUSTODIAL	38	38	38	38	38	38	38	38
7527	FORMAN,R	779	57	CUSTODIAL	57	57	57	57	57	57	57	57
7528	FRUSTON	150	20	CUSTODIAL	20	20	20	20	20	20	20	20
7529	GRANT	1,062	96	MAINTAIN	96	96	96	96	96	96	96	96
7530	GRIFFITH	32	32	CUSTODIAL	32	32	32	32	32	32	32	32
7531	HACHLER	261	10	CUSTODIAL	10	10	10	10	10	10	10	10
7532	HAMMEL,L.E.	425	32	CUSTODIAL	32	32	32	32	32	32	32	32
7533	HAMMEL,E.W.	1,577	120	MAINTAIN	120	120	120	120	120	120	0	0
7534	HASTINGS,J.R.	655	56	CUSTODIAL	56	56	56	56	56	56	56	56
7535	HAY CREEK	434	52	CUSTODIAL	52	52	52	52	52	52	52	52
7536	KASKELA FARMS	342	28	CUSTODIAL	28	28	28	28	28	28	7	7
7537	HIX	39	7	CUSTODIAL	7	7	7	7	7	7	7	7
7538	HOGAN	181	26	CUSTODIAL	26	26	26	26	26	26	26	26
7539	HOLMES	647	80	CUSTODIAL	80	80	80	80	80	80	80	80
7540	K AND P	1,695	172	CUSTODIAL	172	172	172	172	172	172	172	172
7541	KASKELA RANCH	1,004	165	MAINTAIN	165	165	165	165	165	165	165	165
7542	GREENVALLEY FARMS	279	50	MAINTAIN	50	50	50	50	50	50	0	0
7543	KETCHUM RANCH	208	18	CUSTODIAL	18	18	18	18	18	18	18	18
7544	KINZEY	55	7	CUSTODIAL	7	7	7	7	7	7	7	7
7545	KORTGE	438	54	IMPROVE	54	54	54	73	54	54	0	0
7546	NARTZ	80	12	CUSTODIAL	12	12	12	12	12	12	12	12
7547	LIMMEROTH	5,489	551	IMPROVE	551	600	550	720	551	551	144	160
7548	LINDLEY	595	41	CUSTODIAL	41	41	41	41	41	41	41	41
7549	MCDERMID	80	6	CUSTODIAL	6	8	6	8	6	6	6	6
7550	JOHNSON	2,235	291	CUSTODIAL	291	291	291	291	291	291	291	291
7551	METTEER	883	87	MAINTAIN	87	87	87	87	87	87	12	12
7553	MORELLI	647	12	CUSTODIAL	12	12	12	12	12	12	2	2
7555	MORROW BROTHERS	160	21	CUSTODIAL	21	21	21	21	21	21	21	21
7556	NORTHUP	160	18	CUSTODIAL	18	18	18	18	18	18	18	18

NO.	ALLOTMENT NAME	ACRES PL	CURRENT ACTIVE USE	CATEGORY	SHORT TERM A	LONG TERM A	SHORT TERM B	LONG TERM B	SHORT TERM C	LONG TERM C	SHORT TERM D	LONG TERM D
					SHORT TERM AND LONG TERM FORAGE USE (AUMS) ALTERNATIVE							
7557	OCHS	120	12	CUSTODIAL	12	12	12	12	12	12	12	12
7558	PATJENS	1,028	131	CUSTODIAL	131	131	131	131	131	131	131	131
7560	PRIDAY,J.	960	85	CUSTODIAL	85	85	85	85	85	85	85	85
7561	PRIDAY BROS.	2,816	193	CUSTODIAL	193	193	193	193	193	193	193	193
7562	QUAALE	40	7	CUSTODIAL	7	7	7	7	7	7	7	7
7563	RANCH AND REC.	360	36	CUSTODIAL	36	36	36	36	36	36	36	36
7564	RECKMANN,J.P.	3,194	198	IMPROVE	198	240	250	290	198	198	45	60
7565	RECKMANN,J.H.	560	53	CUSTODIAL	53	53	53	53	53	53	53	53
7566	RICHARDSON	40	10	CUSTODIAL	10	10	10	10	10	10	10	10
7567	WAGENBLAST	80	10	CUSTODIAL	10	10	10	10	10	10	10	10
7568	SHARP,A.J.	2,576	82	IMPROVE	82	95	150	180	82	82	32	50
7569	SHARP,P.	480	42	CUSTODIAL	42	42	42	42	42	42	42	42
7570	JOHNSON	120	15	CUSTODIAL	15	15	15	15	15	15	15	15
7571	SMITH,E.V.	170	26	CUSTODIAL	26	26	26	26	26	26	26	26
7572	SMITH,W.C.	41	7	CUSTODIAL	7	7	7	7	7	7	7	7
7573	WOODSIDE,VAN	80	8	CUSTODIAL	8	8	8	8	8	8	8	8
7576	URBACH	65	119	CUSTODIAL	119	119	119	119	119	119	119	119
7577	TWO SPRINGS	1,534	116	MAINTAIN	116	116	116	116	116	116	107	107
7578	GEORGE WARD	1,804	291	CUSTODIAL	291	291	291	291	291	291	291	291
7579	WEBB,W.L.	2,978	242	MAINTAIN	242	242	242	242	242	242	121	121
7580	VIBBERT	162	10	CUSTODIAL	10	10	10	10	10	10	10	10
7581	ROSE	42	43	CUSTODIAL	43	43	43	43	43	43	43	43
7582	WILLIAMS	69	7	CUSTODIAL	7	7	7	7	7	7	7	7
7583	NIELSEN	1,245	92	MAINTAIN	92	92	92	92	92	92	0	0
7584	WOODSIDE,H.	105	11	CUSTODIAL	11	11	11	11	11	11	0	0
7585	WOODSIDE,L.	300	51	CUSTODIAL	51	51	51	51	51	51	51	51
7587	AUSTIN	160	8	CUSTODIAL	8	8	8	8	8	8	8	8
7588	ASHLEY	314	35	CUSTODIAL	35	35	35	35	35	35	35	35
7590	MILLER	40	8	CUSTODIAL	8	8	8	8	8	8	8	8
7591	ROTH	720	34	CUSTODIAL	34	34	34	34	34	34	34	34
7592	GRIFFITH	1,167	95	MAINTAIN	95	95	95	95	95	95	75	75
7594	IRIBARREN	799	58	CUSTODIAL	58	58	58	58	58	58	25	25
7596	GAY	718	28	CUSTODIAL	28	28	28	28	28	28	28	28
	TOTALS	292,736	17,778	17,778	19,920	19,199	24,217	17,778	17,778	12,309	13,834	

Appendix L - Rangeland Developments Proposed Under Alternatives A and B

ALLOTMENT NUMBER	NAME	ALTERNATIVE A FENCE (MI.) MGT.	FENCE (MI.) RIPAR.	SPNG. DEVEL. (NO.)	BRUSH CTRL. (ACRES)	ALTERNATIVE B FENCE (MI.) MGT.	FENCE (MI.) RIPAR	SPNG. DEVEL (NO.)	BRUSH BURN (ACRES)	CONTROL BURN/SEED (ACRES)
2500	FRANK ANDERSON	0.00	0.00	–	—	0.00	0.00	–	—	—
2501	ASHER, HERBERT	0.00	1.00	–	200	0.00	0.00	–	200	—
2502	BRUSH CREEK	0.00	1.00	–	—	0.00	0.00	–	—	—
2503	ASHER, HUBERT	0.00	0.00	–	—	0.00	0.00	–	—	—
2504	BARKER	0.00	0.00	–	—	0.00	0.00	–	—	—
2505	BARNETT	0.00	0.00	–	—	0.00	0.00	–	—	—
2506	MAXINE BARNETT	0.00	0.00	–	—	0.00	0.00	–	—	—
2507	BROOKS	0.00	0.00	–	—	0.00	0.00	–	—	—
2508	BEAR CREEK	0.00	0.00	–	—	0.00	0.00	–	—	—
2509	BELSHE	0.00	0.60	–	—	0.00	0.60	–	—	—
2512	BIG MUDDY	10.00	2.00	4	—	10.00	0.00	4	—	—
2513	BIG SKY	0.00	2.00	–	—	0.00	0.00	–	—	—
2514	BLACK ROCK	0.00	0.00	–	—	0.00	0.00	–	—	—
2515	DONALD R. JOHNSON	0.00	1.75	–	—	0.00	1.50	–	—	—
2517	BORSCHOWA	0.00	0.00	–	—	0.00	0.00	–	—	—
2518	PINE CREEK	0.00	1.50	–	—	0.00	1.50	–	—	—
2519	BIG SUMMIT EAST	0.00	2.35	–	—	0.00	0.00	–	—	—
2520	BOYNTON	0.00	0.25	–	—	0.00	0.25	–	—	—
2521	HORSESHOE BEND	0.00	0.50	–	—	0.00	0.25	–	—	—
2522	JAMES BROWN	0.00	1.50	–	—	0.00	1.50	–	—	—
2523	BUCK	0.00	0.00	–	—	0.00	0.00	–	—	—
2524	JACK CAMPBELL	0.00	0.00	–	—	0.00	0.00	–	—	—
2525	ROCK CREEK	0.00	1.00	–	—	0.00	0.00	–	—	—
2526	PETER CAMPBELL	0.00	0.00	–	—	0.00	0.00	–	—	—
2528	W.I. CHAPMAN	0.00	0.00	–	—	0.00	0.00	–	—	—
2529	F.C. CHERRY	0.00	0.00	–	—	0.00	0.00	–	—	—
2530	CIMMIYOTTI	0.00	0.00	–	—	0.00	0.00	–	—	—
2531	CIRCLE BAR	0.00	0.00	–	—	0.00	0.00	–	—	—
2532	T. COLE	0.00	0.75	–	—	0.00	0.75	–	—	—
2533	SUTTON MOUNTAIN	0.00	1.50	–	—	0.00	1.50	–	—	—
2534	COLLINS RANCHES, INC.	0.00	0.00	–	—	0.00	0.00	–	—	—
2535	HAYFIELD	0.00	0.50	–	—	0.00	0.00	–	—	—
2536	SPRING BASIN	2.00	0.00	–	—	2.00	0.00	–	—	—
2537	DAVIS	0.00	1.00	–	—	0.00	1.00	–	—	—
2538	DECKER	0.00	1.00	–	—	0.00	0.50	–	—	—
2539	DORMAIER	0.00	0.00	–	—	0.00	0.00	–	—	—
2540	PERSIMMON WOODS	0.00	0.00	–	—	0.00	0.00	–	—	—
2541	EAKIN	0.00	0.00	–	—	0.00	0.00	–	—	—
2542	BIG SUMMIT	0.00	1.00	–	—	0.00	0.00	–	—	—
2543	ELLSWORTH	0.00	0.00	–	—	0.00	0.00	–	—	—
2544	CIRCLE S RANCH	0.00	1.00	–	—	0.00	0.00	–	—	—
2545	FORREST SOLOMON	0.00	0.60	–	—	0.00	0.00	–	—	—
2546	GREEN	0.00	0.00	–	—	0.00	0.00	–	—	—
2547	GRIFFITH	0.00	4.00	–	500	0.00	4.00	–	500	—
2548	HOGAN CREEK	0.00	0.00	–	—	0.00	0.00	–	—	—
2549	HARDIE	0.00	0.25	–	—	0.00	0.00	–	—	—
2550	FRED HANSON	0.00	0.00	–	—	0.00	0.00	–	—	—
2551	CLINTON O. HARRIS	0.00	1.50	–	—	0.00	0.00	–	—	—
2552	BUCKHORN	0.00	0.00	–	—	0.00	0.00	–	—	—
2553	HIGLEY	0.00	0.15	–	—	0.00	0.15	–	—	—
2554	CHARLES H. HILL	0.00	1.00	–	—	0.00	0.50	–	—	—
2556	MURRAY HOWARD	0.00	2.00	–	—	0.00	1.50	–	—	—
2557	HULDEN	0.00	0.00	–	—	0.00	0.00	–	—	—
2558	HUMPHREYS BROTHERS	3.00	4.00	–	—	3.00	0.00	–	—	—
2559	FOPIANO	0.00	0.60	–	—	0.00	0.00	–	—	—
2560	BASE LINE	0.00	0.60	–	200	0.00	0.00	–	200	—
2561	JACKSON	0.00	0.75	–	—	0.00	0.75	–	—	—
2562	J BAR S	0.00	0.50	–	—	0.00	0.00	–	—	—
2563	DONALD R. JOHNSON	0.00	1.00	–	—	0.00	0.00	–	—	—
2564	DONALD R. JOHNSON	0.00	0.00	–	—	0.00	0.00	–	—	—
2565	LEROY A. BRITT	0.00	0.60	–	—	0.00	0.00	–	—	—
2566	JUSTESON	0.00	0.00	–	—	0.00	0.00	–	—	—
2567	KASER BROTHERS	2.00	0.00	–	—	2.00	0.00	–	—	—
2568	KEEGAN	0.00	0.50	–	—	0.00	0.00	–	—	—
2569	ZACK T. KEYS	0.00	1.00	–	400	0.00	1.00	–	400	—

ALLOTMENT NUMBER	NAME	ALTERNATIVE A FENCE (Mi.) MGT.	FENCE (Mi.) RIPAR.	SPNG. DEVEL. (NO.)	BRUSH CTRL. (ACRES)	ALTERNATIVE B FENCE (Mi.) MGT.	FENCE (Mi.) RIPAR	SPNG. DEVEL (NO.)	BRUSH BURN (ACRES)	CONTROL BURN/SEED (ACRES)
2570	ZACK T. KEYS	0.00	0.00	-	400	0.00	0.00	--	400	----
2571	HORN BUTTE	5.00	2.00	--	1,500	5.00	2.00	--	1,500	----
2572	LAFFOON AND CARLSON	0.00	2.50	--	----	0.00	2.50	--	----	----
2574	LEAR	0.00	0.00	--	----	0.00	0.00	--	----	----
2575	ANDREW F. LECKIE,JR.	0.00	0.25	--	----	0.00	0.25	--	----	----
2578	LOGAN	0.00	0.00	--	----	0.00	0.00	--	----	----
2579	EUGENE LOGAN JR.	0.00	0.30	--	300	0.00	0.00	--	300	----
2580	BIG SUMMIT WEST	0.00	1.35	--	----	0.00	0.00	--	----	----
2581	ELSIE MARTIN	0.00	0.00	--	----	0.00	0.00	--	----	----
2582	GRAY PRAIRIE	0.00	0.00	--	----	0.00	0.00	--	----	----
2583	MULKEY	0.00	0.00	--	----	0.00	0.00	--	----	----
2584	CATHERINE MAURER	10.00	9.00	--	----	10.00	4.00	--	----	2,000
2585	SEEK PEAK	0.00	0.00	--	----	0.00	0.00	--	----	----
2586	TOM MCDONALD	0.00	0.50	--	----	0.00	0.00	--	----	----
2587	HERBERT F. MCKAY	0.00	0.00	--	----	0.00	0.00	--	----	----
2588	SPUD	0.00	0.75	--	----	0.00	0.00	--	----	----
2589	MCQUINN	0.00	0.00	--	----	0.00	0.00	--	----	----
2591	MILLER	0.00	1.25	--	----	0.00	1.25	--	----	----
2592	MARY MISENER	0.00	0.00	--	----	0.00	0.00	--	----	----
2593	VERNE A. MOBLEY	0.00	2.50	--	----	0.00	2.50	--	----	----
2594	MOREHOUSE AND ELLIOT	0.00	0.00	--	----	0.00	0.00	--	----	----
2595	MORRIS	0.00	1.25	--	----	0.00	0.50	--	----	160
2596	HOWARD MORTIMORE	0.00	0.00	--	----	0.00	0.00	--	----	----
2597	JOHN T. MURTHA	0.00	4.75	--	----	0.00	3.00	--	----	----
2598	HAY CREEK	0.00	1.00	--	----	0.00	0.50	--	----	----
2599	KENNETH MYERS	0.00	0.00	--	----	0.00	0.00	--	----	----
2600	J. WILLIS NARTZ	0.00	0.00	--	----	0.00	0.00	--	----	----
2601	VICTOR B. NASH	0.00	0.00	--	----	0.00	0.00	--	----	----
2602	ERNEST L. PARSLEY	0.00	0.00	--	----	0.00	0.00	--	----	----
2603	LEE H. PETTYJOHN	0.00	0.00	--	----	0.00	0.00	--	----	80
2604	PHILIPPI	0.00	0.00	--	----	0.00	0.00	--	----	----
2605	E. GLENN POTTER	0.00	0.00	--	----	0.00	0.00	--	----	----
2606	WILLIAM W. POTTER	0.00	0.00	--	----	0.00	0.00	--	----	----
2607	PRYOR FARMS	0.00	2.00	--	100	0.00	0.00	--	100	----
2608	RATTRAY A	0.00	1.00	--	----	0.00	1.00	--	----	----
2609	RATTRAY B	0.00	0.00	--	----	0.00	0.00	--	----	----
2610	RATTRAY C	0.00	0.00	--	----	0.00	0.00	--	----	----
2611	VAN RIETMAN	0.00	0.00	--	----	0.00	0.00	--	----	----
2612	ARTHUR N. ROBISON	0.00	0.00	--	----	0.00	0.00	--	----	----
2613	FRANK R. ROBISON	0.00	0.00	--	----	0.00	0.00	--	----	----
2614	R AND R ROLFE	0.00	1.00	--	----	0.00	0.50	--	----	----
2615	ROLFE	0.00	0.00	--	----	0.00	0.00	--	----	----
2616	ORVILLE RUGGLES	0.00	0.00	--	----	0.00	0.00	--	----	----
2617	SCHUF	0.25	1.50	--	100	0.25	0.00	--	100	----
2619	SID SEALE	0.00	2.00	--	1,500	0.00	2.00	--	1,500	----
2620	EVELYN E. SEE	0.00	0.50	--	----	0.00	0.00	--	----	----
2621	EARL A. SMITH	0.00	0.00	--	----	0.00	0.00	--	----	----
2622	ALTA M. SPAULDING	0.00	0.00	--	----	0.00	0.00	--	----	----
2623	STEIWER RANCHES	0.00	1.50	--	----	0.00	0.75	--	----	----
2624	THOMAS M. STEPHENS	0.00	1.00	--	----	0.00	0.00	--	----	----
2625	DAVID M. STIREWALT	0.00	0.00	--	----	0.00	0.00	--	----	----
2626	J.M. STIREWALT	5.00	2.50	--	----	5.00	0.75	--	----	----
2627	ROBERT W. STRAUB	0.00	0.00	--	----	0.00	0.00	--	----	----
2628	THOMAS F. SUMNER	0.00	0.00	--	600	0.00	0.00	--	600	----
2629	TATUM	0.00	1.00	--	----	0.00	1.00	--	----	----
2630	TRIPP	0.00	0.00	--	----	0.00	0.00	--	----	----
2631	DIPPING VAT	0.00	0.50	--	----	0.00	0.00	--	----	----
2632	LARSON	0.00	0.00	--	----	0.00	0.00	--	----	----
2633	RATTLESNAKE	3.00	2.00	2	----	3.00	2.00	2	----	----
2634	WADE BROTHERS	0.00	0.00	--	----	0.00	0.00	--	----	----
2635	RICHARD FOSTER	0.00	0.00	--	----	0.00	0.00	--	----	----
2636	GEORGE WEEDMAN	0.00	0.40	--	----	0.00	0.00	--	----	----
2637	V.O. WEST	0.00	0.25	--	----	0.00	0.00	--	----	----
2638	VIRGIL M. WOELPERN	0.00	0.00	--	----	0.00	0.00	--	----	----
2639	TUBB CREEK	0.00	1.00	--	----	0.00	0.00	--	----	----
2641	JESS L. ROSS	0.00	0.00	--	----	0.00	0.00	--	----	----
2642	MASCALL, LILLIAN C.	3.00	0.00	--	----	3.00	0.00	--	----	----
2643	CHARLES H. HILL	0.00	0.00	--	----	0.00	0.00	--	----	----
2644	HI MEADOWS	0.00	0.00	--	----	0.00	0.00	--	----	----
2645	CLARK	0.00	3.00	--	----	0.00	3.00	--	----	----

ALLOTMENT NUMBER	NAME	ALTERNATIVE A FENCE (MI.) MGT.	FENCE (MI.) RIPAR.	SPNG. DEVEL. (NO.)	BRUSH CTRL. (ACRES)	ALTERNATIVE B FENCE (MI.) MGT.	FENCE (MI.) RIPAR	SPNG. DEVEL (NO.)	BRUSH BURN (ACRES)	CONTROL BURN/SEED (ACRES)
2646	LONEROCK	0.00	0.00	–	—	0.00	0.00	–	—	—
2647	RATTRAY D	0.00	0.00	–	—	0.00	18.90	–	—	—
2648	HARTUNG	0.00	0.00	–	200	0.00	0.00	–	200	—
2649	RIM	0.00	0.00	–	—	0.00	0.00	–	—	—
2650	FOX CANYON	0.00	0.00	–	—	0.00	0.00	–	—	—
2651	BULL CANYON	0.00	0.00	–	—	0.00	0.00	–	—	—
2652	LIGHTHART	0.00	0.00	–	—	0.00	0.00	–	—	—
2653	BROOKS LEASE	0.00	0.00	–	—	0.00	0.00	–	—	—
2654	CROSSROADS	0.00	0.00	–	—	0.00	0.00	–	—	—
2655	NORTON RANCH	0.00	0.00	–	—	0.00	0.00	–	—	—
2656	DRY KNOB	0.00	0.00	–	—	0.00	0.00	–	—	—
2657	BRIDGE CREEK	0.00	0.00	–	—	0.00	0.00	–	—	—
2660	RATTLESNAKE CREEK	0.00	0.00	–	—	0.00	0.00	–	—	—
2661	PEBBLE SPRINGS	0.00	0.00	–	—	0.00	0.00	–	—	—
4076	COTTONWOOD CREEK	0.00	0.50	–	—	0.00	0.00	–	—	—
4131	DAY CREEK	0.00	0.50	–	—	0.00	0.00	–	—	—
4145	TWO COUNTY	0.00	4.00	–	—	0.00	0.00	–	—	—
7501	BIRD	1.50	2.00	2	—	1.50	2.00	2	—	—
7503	BORTHWICK	0.00	0.00	–	—	0.00	0.00	–	—	—
7505	BEUTHER	0.00	0.00	–	—	0.00	0.00	–	—	—
7507	CLAUSEN	1.00	0.00	–	—	1.00	0.00	–	—	—
7508	CLAYMIER,L	0.00	0.00	–	—	0.00	0.00	–	—	—
7510	CONLEY	0.00	0.00	–	—	0.00	0.00	–	—	—
7511	CONNOLLY	2.00	2.00	1	240	2.00	2.00	1	240	—
7512	CONROY,P.J.	0.00	2.00	–	—	0.00	0.00	–	—	—
7513	CONROY,J	0.00	0.00	–	—	0.00	0.00	–	—	—
7514	COOPER	0.00	0.00	–	—	0.00	0.00	–	—	—
7516	GOMES	0.00	0.00	–	—	0.00	0.00	–	—	—
7517	DRIVER	0.00	0.00	–	—	0.00	0.00	–	—	—
7518	DELUDE	2.50	0.50	–	—	2.50	0.50	–	—	—
7519	DICK	0.00	0.00	–	—	0.00	0.00	–	—	—
7520	DULING	0.00	0.50	–	—	0.00	0.00	–	—	—
7521	DURETTE	0.00	1.50	–	—	0.00	0.00	–	—	—
7523	WHITE RIVER ODFW CMA	0.00	0.00	–	—	0.00	0.00	–	—	—
7524	FESSLER	0.00	0.00	–	—	0.00	0.00	–	—	—
7525	FOLMSBEE	0.00	0.50	–	—	0.00	0.00	–	—	—
7526	FORMAN,C	0.00	0.50	–	—	0.00	0.50	–	—	—
7527	FORMAN,R	0.00	0.00	–	—	0.00	0.00	–	—	—
7528	FUSTON	0.00	0.00	–	—	0.00	0.00	–	—	—
7529	GRANT	0.00	0.00	–	—	0.00	0.00	–	—	—
7530	GRIFFITH	0.00	0.00	–	—	0.00	0.00	–	—	—
7531	HACHLER	0.00	0.50	–	—	0.00	0.50	–	—	—
7532	HAMMEL,L.E.	0.00	0.00	–	—	0.00	0.00	–	—	—
7533	HAMMEL,E.W.	0.00	0.00	–	—	0.00	0.00	–	—	—
7534	HASTINGS,J.R.	0.00	0.00	–	—	0.00	0.00	–	—	—
7535	HAY CREEK	0.00	0.00	–	—	0.00	0.00	–	—	—
7536	KASKELA FARMS	0.00	0.00	–	—	0.00	0.00	–	—	—
7537	HIX	0.00	0.00	–	—	0.00	0.00	–	—	—
7538	HOGAN	0.00	0.00	–	—	0.00	0.00	–	—	—
7539	HOLMES	0.00	0.50	–	—	0.00	0.50	–	—	—
7540	K AND P	0.00	5.00	–	—	0.00	0.00	–	—	—
7541	KASKELA RANCH	0.00	0.00	–	—	0.00	0.00	–	—	—
7542	GREENVALLEY FARMS	0.00	0.00	–	—	0.00	0.00	–	—	—
7543	KETCHUM RANCH	0.00	0.00	–	—	0.00	0.00	–	—	—
7544	KINZEY	0.00	0.00	–	—	0.00	0.00	–	—	—
7545	KORTGE	2.00	1.00	–	—	2.00	0.00	–	—	—
7546	NARTZ	0.00	0.50	–	—	0.00	0.50	–	—	—
7547	LIMMEROTH	3.00	0.00	–	600	3.00	0.00	–	600	—
7548	LINDLEY	0.00	2.00	–	—	0.00	0.00	–	—	—
7549	MCDERMID	0.00	0.25	–	—	0.00	0.00	–	—	—
7550	JOHNSON	0.00	0.25	–	—	0.00	0.00	–	—	—
7551	METTEER	0.00	0.00	–	—	0.00	0.00	–	—	—
7553	MORELLI	0.00	1.50	–	—	0.00	0.75	–	—	—
7555	MORROW BROTHERS	0.00	0.00	–	—	0.00	0.00	–	—	—
7556	NORTHUP	0.00	0.00	–	—	0.00	0.00	–	—	—
7557	OCHS	0.00	0.00	–	—	0.00	0.00	–	—	—
7558	PATJENS	0.00	2.00	–	—	0.00	2.00	–	—	—
7560	PRIDAY,J.	0.00	0.00	–	—	0.00	0.00	–	—	—
7561	PRIDAY BROS.	0.00	0.00	–	—	0.00	0.00	–	—	—
7562	QUAALE	0.00	0.00	–	—	0.00	0.00	–	—	—

ALLOTMENT NUMBER	NAME	ALTERNATIVE A FENCE (MI.) MGT.	FENCE (MI.) RIPAR.	SPNG. DEVEL. (NO.)	BRUSH CTRL (ACRES)	ALTERNATIVE B FENCE (MI.) MGT.	FENCE (MI.) RIPAR	SPNG. DEVEL (NO.)	BRUSH BURN (ACRES)	CONTROL BURN/SEED (ACRES)
7563	RANCH AND REC.	0.00	0.00	--	----	0.00	0.00	--	----	----
7564	RECKMANN,J.P.	3.00	0.00	2	200	3.00	0.00	2	200	----
7565	RECKMANN,J.H.	0.00	0.00	--	----	0.00	0.00	--	----	----
7566	RICHARDSON	0.00	0.00	--	----	0.00	0.00	--	----	----
7567	WAGENBLAST	0.00	0.00	--	----	0.00	0.00	--	----	----
7568	SHARP,A.J.	2.00	2.00	2	400	2.00	0.00	2	400	----
7569	SHARP,P.	0.00	0.00	--	----	0.00	0.00	--	----	----
7570	JOHNSON	0.00	0.00	--	----	0.00	0.00	--	----	----
7571	SMITH,E.V.	0.00	0.00	--	----	0.00	0.00	--	----	----
7572	SMITH,W.C.	0.00	0.00	--	----	0.00	0.00	--	----	----
7573	WOODSIDE,VAN	0.00	0.00	--	----	0.00	0.00	--	----	----
7576	URBACH	0.00	0.00	--	----	0.00	0.00	--	----	----
7577	TWO SPRINGS	0.00	1.95	--	----	0.00	0.70	--	----	----
7578	GEORGE WARD	0.00	0.00	--	----	0.00	0.00	--	----	----
7579	WEBB,W.L.	0.00	4.00	--	360	0.00	4.00	--	360	----
7580	VIBBERT	0.00	0.00	--	----	0.00	0.00	--	----	----
7581	ROSE	0.00	0.00	--	----	0.00	0.00	--	----	----
7582	WILLIAMS	0.00	0.00	--	----	0.00	0.00	--	----	----
7583	NIELSEN	0.00	0.00	--	----	0.00	0.00	--	----	----
7584	WOODSIDE,H.	0.00	0.00	--	----	0.00	0.00	--	----	----
7585	WOODSIDE,L.	0.00	0.00	--	----	0.00	0.00	--	----	----
7587	AUSTIN	0.00	0.00	--	----	0.00	0.00	--	----	----
7588	ASHLEY	0.00	1.00	--	----	0.00	1.00	--	----	----
7590	MILLER	0.00	0.00	--	----	0.00	0.00	--	----	----
7591	ROTH	0.00	2.50	--	----	0.00	0.00	--	----	----
7592	GRIFFITH	0.00	2.00	--	----	0.00	2.00	--	----	----
7594	IRIBARREN	0.00	0.00	--	----	0.00	0.00	--	----	----
7598	GAY	0.00	0.00	--	----	0.00	0.00	--	----	----
	TOTALS	60.25	131.25	13	7,800	60.25	80.60	13	7,800	2,240

Appendix M Water Quality Measurements Deschutes River Basin

Stream	River Mile	Date	Time	Temperature °F Air	Water	cfs	Flow Turb.	Spec. Cond.	Dis. 0 2 mg/l	pH	CO 2 mg/l	Total Alkalinity mg/l Ca CO 3	Nitrate mg/l
Station 1	25.0	8/20/81	0800	60	60	4100	2	140	9	7.6	8	70	0.6
(Macks Can.)		9/28/83	1530	65	56	6000	10	265	11	8.2	8	80	0.4
Station 2	42.8	8/20/81	0930	62	60	4100	12	140	10	7.8	4	70	0.5
(Buck Hollow)		9/29/83	1000	40	53	6000	2	220	10	7.8	4	80	0.6
Station 3	58.0	8/1/81	1630	84	61	4000	0	140	11	7.8	2	80	0.5
(Nena Creek)		9/28/83	1200	57	54	5700	2	260	9	7.5	4	70	0.35
Station 4	84.0	8/19/81	1440	89	58	4000	0	145	10	7.6	4	70	0.5
(South Junc.)		9/28/83	1015	50	64	5700	5	280	8	7.55	6	70	0.55
Station 5	98.15	8/19/81	1245	89	56	3800	0	155	10	7.5	4	70	0.75
(Warm Springs)		9/22/83	1330	64	58	5000	2	260	9	7.8	8	70	0.35
Station 6	128.9	8/19/81	1000	79	55	300	0	160	9	7.4	8	80	0.7
(Steelhead Falls)		9/16/83	1330	70	56	200	0	330	11	7.4	8	70	0.45
Gordon Canyon	0.1	8/6/81	0745	65	59	0.2	0	475	8	7.3	24	200	0.0
Fall Canyon	0.25	8/6/81	0830	64	65	0.25	0	245	8	6.8	24	180	1.35
Harris Canyon	0.2	8/6/81	0915	77	64	2.0	0	260	8	7.4	12	130	0.85
Buck Hollow	0.0	8/20/81	1030	65	64	2.0	0	390	10	7.8	8	190	0.7
		4/29/83	1100	50	50	3.0	1	380	10	8.2	8	200	0.4
	20.55	8/6/81	1446	95	76	3.0	0	250	12	8.7	0	140	0.4
Finnegan Can.	3.7	8/14/81	0951	--	--	2.0	0	--	10	7.5	16	190	0.6
Wood Gulch	0.7	8/14/81	0900	--	--	0.25	0	--	8	7.3	16	130	0.6
WHITE River													
Station 1	5.25	8/20/81	1150	65	60	70.0	89	95	9	7.3	4	50	0.1
		9/29/83	1215	54	45	80	60	185	13	7.8	4	50	
1a	14.75	8/6/81	1140	84	61	100.0	80	10	7.6	4	40	0.35	
Station 2	17.5	8/20/81	1311	72	58	85.0	800	60	9	--	8	35	--
		9/29/83	1330	61	42	80	90	150	11	7.4	8	40	--
Tygh Creek	8.0	8/6/81	1000	69	58	4.0	0	90	9	7.1	8	50	0.45
McCubbins Gul.	6.4	8/6/81	1100	80	58	30.0	11	40	8	7.1	4	30	0.5
Bakeoven Creek	0.2	8/20/81	1505	77	78	2.0	0	250	9	9.0	0	150	0.45
		9/28/83	1300	63	60	5.0	1	460	12	9.05	0	110	0.35
Deep Creek	0.45	8/6/81	1410	93	81	0.5	0	220	13	8.9	0	150	0.3
Cottonwood Cr.	0.0	8/6/81	1330	97	70	0.5	0	245	10	7.6	12	130	0.4
Wapinitia Cr.	0.1	8/6/81	1250	94	70	0.3	3	200	8	7.6	12	110	0.55
Cove Creek	0.75	8/14/81	1046	--	--	0.5	0	--	8	7.3	16	200	0.6
Swamp Creek	0.2	8/14/81	1130	--	--	0.4	1	--	8	7.8	12	220	0.25
Trout Creek	1.2	7/8/81	1430	75	72	50.0	0	340	9	8.8	0	150	0.65
		9/20/83	1115	55	52	20.0	5	660	12	8.7	12	170	0.60
	24.8	7/10/81	1030	65	61	10.0	2	300	0	160			
		9/19/83	1130	53	58	5.0	0	770	10	8.6	16	200	0.30
Bircher Creek	0.15	7/9/81	1030	76	64	0.25	0	340	8	7.2	20	180	0.5
		9/20/83	1010	52	54	1.0	0	630	12	8.0	16	180	0.35
Trib. to Sage-brush Creek	0.65	7/9/81	1415	79	70	0	2	700	7	7.4	48	360	0.7

Stream	River Mile	Date	Time	Temperature °F Air	Water	cfs	Flow Turb.	Spec. Cond.	Dis. 0 2 mg/1	pH	CO 2 mg/1	Total Alkalinity mg/1 Ca CO 3	Nitrate mg/1
Ward Creek	0.6	8/7/81	1400	94	70	0.2	0	280	6	7.4	12	140	0.4
		10/5/83	1345	64	58	3.0	0	460	11	8.2	12	130	0.35
Willow Creek	0.5	7/8/81	1010	63	64	60.0	5	380	8		8	140	1.8
	3.4	7/8/81	1255	78	63	0.25	9	190	13	9.2	0	20	0.4
CROOKED RIVER Station 1	9.5	9/1/81	0940	69	58	300.0	0	230	9	7.8	12	120	0.6
		9/16/83	1130	66	59	350.0	2	610	10	8.1	8	120	0.45
Station 2 Smoth Rocks)	23.5	9/1/81	1240	67	63	75.0	12	395	10	8.3	14	200	0.45
		9/16/83	0930	58	57	250	5	840	9	7.8	16	170	0.30

Water Quality Measurements John Day River Basin

Stream	River Mile	Date	Time	Temperature °F Air	Water	cfs	Flow Turb.	Spec. Cond.	Dis. 0 2 mg/1	pH	CO 2 mg/1	Total Alkalinity mg/1 Ca CO 3	Nitrate mg/1
		1981											
Station 1 (McDonnald	20.5	7/28	1615	86	79	200.0	2	265	9	8.2	8	150	0.4
		10/6/83	1330	68	60	350.0	9	620	9	8.2	4	160	0.25
	Ford)												
Station 2 (Cottonwood Bridge)	39.5	7/30	1430	84	75	200.0	0	275	10	8.4	4	140	0.45
		10/12/83	1115	59	57	450.0	3	445	10	8.5	12	160	0.35
Station 3 (30 mile Creek)	85.75	8/7	0910	80	74	150.0	0	305	8	8.2	8	160	0.45
		10/7/83	1650	63	61	375.0	2	470	13	8.6	10	110	0.30
Station 4 (Clarno)	109.25	8/7	1230	92	77	100.0	0	310	8	7.6	12	160	0.45
	10/5/83	1205	62	59	350.0	6	640	9	8.1	8	180	0.25	
Section 5 (Horseshoe Bridge)	162.0	7/31	1000	76	72	200.0	1	250	7	8.1	8	140	0.6
		10/12/83	1415	67	56	450.0	5	460	10	7.85	4	150	0.4
Section 6 (Kimberly)	178.0	7/5	0930	76	71	200.0	0	235	7	8.1	16	130	0.45
		10/13/83	1230	59	56	450.0	5	540	11	8.4	16	140	0.40
Columbia River 8 Mile Canyon	2.0	1981 7/30	1030	76	61	0.0	8	700	10	7.8	20	220	0.4
Willow Creek	4.4	7/30	1205	83	75	3.0	2	550	10	7.7	8	220	0.4
John Day River Grass Valley Canyon	1.15	7/28	1540	89	83	0.1	5	480	12	9.6	0	80	0.4
		10/6/83	1230	68	60	4.0	0	820	12	8.7	2	100	0.35
	8.2	7/17	1100	87	74	4.0	5	380	12	8.4	0	160	0.3
Rock Creek (Condon)	48.35	7/17	0830	75	62	8.0	0	260	9	7.4	16	140	0.45
Hay Creek	9.6	7/17	1005	85	79	1.0	12	260	9	9.1	0	110	0.3
		10/7/83	1547	67	65	1.0	0	499	19	8.95	0	90	0.3
	12.75	7/17	0920	78	66	2.0	1	320	10	8.4	4	140	0.4
Ferry Canyon	0.25	7/17	1230	94	88	3.0	2	265	10	9.2	0	130	0.25
		10/7/83	1515	69	60	1.5	0	522	11	9.15	0	120	0.60
Little Ferry	0.15	8/4	0700	63	57	0.1	0	275	8	7.7	8	140	0.65
		Canyon	10/7/83	14 52	0.35	69	60	1.0	0	505	9	8.7	8	120
Jacknife Can.	1.3	7/17	1320	88	60	5.0	0	270	8	6.7	16	110	0.5
		10/7/83	1623	67	54	1.5	0	525	11	7.55	20	120	0.5

Stream	River Mile	Date	Time	Temperature °F Air	Water	cfs	Flow Turb.	Spec. Cond.	Dis. O 2 mg/l	pH	CO 2 mg/l	Total Alkalinity mg/l Ca CO 3	Nitrate mg/l
30 Mile Canyon	1.65	7/23	1445	88	88	5.0	1	245	9	9.7	0	90	0.2
Condon Creek	0.8	7/23	1300	78	75	0.25	1	500	9	8.6	0	220	0.6
East Fork 30 Mile Creek	3.3	7/17	0745	62	53	1.5	0	260	9	7.6	12	130	0.4
Pine Hollow	8.2	8/3	1230	78	70	0.5	0	225	8	7.4	12	130	0.75
		10/7/83	1722	58	58	3.0	0	375	9	7.8	12	100	0.30
Long Hollow	0.75	8/3	1330	78	62	0.5	0	230	8	7.2	12	100	0.2
Brash Canyon	4.5	8/3	1600	74	65	0.1	0	145	7	6.6	16	90	0.4
Sorefoot Creek	1.2	7/16	1510	96	84	0.2	8	280	8	9.3	0	100	0.35
Pine Creek	12.7	7/16	1230	82	64	2.0	3	295	7	7.8	10	170	0.3
Muddy Creek	0.45	7/16	1610	98	81	3.0	1	520	10	8.6	0	260	0.4
Currant Creek	6.55	7/16	1700	88	58	0.1	0	400	6	6.7	28	170	0.35
Nelson Creek	4.95	7/10	1100	66	50	1.0	1	260	10	7.5	4	140	0.45
Girds Creek	3.0	7/31	1100	82	60	2.0	0	610	9	7.9	12	320	0.8
		10/13/83	0957	54	51	2.5	0	1050	11	8.45	18	260	0.70
Horseshoe Creek	0.0	7/31	0920	72	60	1.0	0	370	8	7.8	16	210	0.65
		10/12/83	1500	66	55	2.5	0	335	10	7.6	4	120	0.20
Left Hand Cr	2.4	7/24	0730	58	52	2.0	0	360	8	7.6	12	200	0.5
Indian Hollow	3.2	7/24	1410	85	58	0.1	0	170	9	7.3	8	100	0.4
Johnson Creek	9.7	7/24	0915	53	55	1.5	0	215	8	8.0	4	120	0.5
		9/22/83	1245	65	52	1.5	0	445	10	7.6	12	120	0.3
China Hat Cr.	0.2	7/24	0820	58	56	0.75	0	400	8	7.4	12	240	0.5
McGinnis Cr.	0.3	8/5	1030	76	69	0.5	32	340	8	7.8	12	180	0.25
Squad Creek	1.45	8/5	1220	80	64	4.0	0	220	8	7.5	12	170	0.5
		9/21/83	1045	53	47	4.0	0	560	10	8.2	12	170	0.35
Frank Creek	0.5	7/24	1225	76	68	0.25	0	240	8	7.6	12	180	0.25
		9/21/83	1225	62	50	0.75	1	610	10	7.8	16	180	0.25
Buckhorn Creek	0.25	7/24	1100	72	66	3.0	2	275	8	8.3	4	160	0.35
		9/21/83	1315	65	52	1.5	0	550	10	8.0	12	150	0.25
Indian Creek	2.1	7/24	1015	85	62	2.0	0	230	8	7.4	8	120	0.7
	0.01	9/21/83	1350	65	55	2.0	0	380	11	8.4	4	100	0.3
Rock Creek (Antone)	1.75	8/5	1500	88	85	7.0	1	255	9	9.0	0	160	0.25
		10/4/83	1045	62	58	10.0	3	530	9	9.1	4	180	0.30
	15.05	8/5	1630	81	65	12.0	0	130	8	7.4	12	90	0.3
		10/4/83	1200	64	46	10.0	0	260	10	8.1	8	70	0.35
Birch Creek	3.8	7/22	1015	70	54	4.0	5	280	8	7.6	8	150	0.3
		10/3/83	1030	55	47	5.0	0	520	11	8.2	8	160	0.35
West Fork Birch Creek	0.45	7/22	1430	79	60	2.5	0	285	8	7.4	12	140	0.45
		10/3/83	1220	52	44	2.0	0	600	9	7.7	12	170	0.30
	2.3	7/22	1300	88	50	2.0	0	165	9	7.4	4	90	0.5
		10/3/83	1330	53	41	1.0	0	590	9	7.6	8	175	0.25
Trib. to WF Birch Creek	0.0	7/22	1220	68	50	0.5	0	150	9	7.4	4	80	0.55
		10/3/83	1400	53	40	0.5	0	610	10	7.9	8	160	0.20
East Fork Birch Creel	1.0	20/3/83	1130	56	46	3.0	0	450	9	7.6	12	150	0.35

Stream	River Mile	Date	Time	Temperature °F Air	Water	cfs	Flow Turb.	Spec. Cond.	Dis. O 2 mg/l	pH	CO 2 mg/l	Total Alkalinity mg/l Ca CO 3	Nitrate mg/l
Willow Creek	0.45	7/20	1410	80	78	2.0	2	350	10	8.4	0	200	0.4
		9/22/83	1000	54	46	2.0	2	790	9	7.75	16	220	0.20
Fopiano Creek	0.15	7/20	1330	80	78	1.5	18	365	9	8.0	10	210	0.25
Day Creek	1.85	8/5	1400	79	60	0.25	0	350	8	7.4	20	210	0.45
Trout Creek	33.35	7/9/81	1330	74	63	15.0	6	215	9	8.6	0	110	0.4
		9/19/83	1330	58	64	5.0	0	570	10	8.4	4	150	0.3

Appendix N Stream Channel Stability, Fish Habitat and Estimated Trend Deschutes Basin

Stream	Public[1] Stream Miles	Allotment(s)	Present Stream Channel Condition	Present Fish Habitat Condition	Estimated Trend	Fish[2] Species Present	Comments
Deschutes River (Columbia River to Pelton Dam)	4.1	7568	Good	Good	Stable	Rb, St,	Flows table, water temperature constant, dam migration, 20 foot falls, Indian dip net fishery, sport fishery, excellent bank condition, good water quality.
	0.55	7533	Excellent	Good	Stable	Chs, Chf,	
	3.5	7507	Excellent	Good	Stable	Dv, Lb,	
	0.6	7532	Excellent	Good	Stable	Sc, C, D,	
	17.0	7547	Excellent	Good	Stable	RsS, Brb,	
	5.4	7501	Excellent	Good	Stable	Wt, Sq,	
	9.85	7564	Excellent	Good	Stable	Co, Ss,	
	5.25	7579	Excellent	Good	Stable	Bls, Csu,	
	1.25	7512	Excellent	Excellent	Stable	Cch, R,	
	5.85	7511	Excellent	Good	Stable	Pm, Cc	
	1.1	7584	Excellent	Good	Stable		
	3.15	7553	Excellent	Good	Stable		
	5.10	7583	Excellent	Good	Stable		
	2.55	7592	Excellent	Good	Stable		
	1.1	7577	Excellent	Good	Stable		
	1.3	7536	Excellent	Good	Stable		
	2.8	7594	Excellent	Good	Stable		
	1.5	7541	Excellent	Good	Stable		
	1.15	7542	Excellent	Good	Stable		
	4.55	7518	Good	Good	Stable		
	3.75	7551	Excellent	Good	Stable		
	7.70	Unallotted	Excellent	Good	Stable		
Deschutes River (Lake Billy Chinook to Jefferson-Deschutes County line)	8.1	Unallotted	Excellent	Good	Stable	Rb, Bt, Wt, R, Cch, Dv, Ch, D, Sc, Sq, Brb, Sb, Ss, Co, Csu	Good streamside cover, irrigation withdrawal, good water quality.

[1]Allotment boundaries are in the center of the river, therefore only bank miles can be given for the Deschutes River

[2]Rb-Rainbow Trout
Bt-Brown Trout
DV-Dolly Varden
St-Summer Steelhead
Ch-Chinook Salmon
Co-Coho Salmon
Pm-Peamouth
Ss-Sockeye Salmon
Lb-Largemouth Bass
Sb-Smallmouth Bass
Brb-Brown Bullhead
Cc-Channel Catfish
R-Tui Chub (Roach)
Su-Sucker
Csu-Coursescale Sucker
Bls-Bridgelip Sucker
D-Dace
Sc-Sculpins
Chs-Spring
Chf-Fall Chinook Salmon
C-Carp
Wt-Western Brook Lamprey
Chiselmouth Chub
Wt-Mountain Whitefish
RsS-Redside Shiner
Chinook Salmon
Sq-Northern Squawfish

Lamprey
Chub
Whitefish
Shiner
Salmon

Stream	Public[1] Stream Miles	Allotment(s)	Present Stream Channel Condition	Present Fish Habitat Condition	Estimated Trend	Fish[2] Species Present	Comments
Gordon Canyon	0.5	7549	Good	Fair	Stable	No Fish	Very low flow, siltation, algae blooms, stream shading limited, possible steelhead spawning area.
Fall Canyon	1.20	7545	Fair	Fair	Declining	St	Intermittent flow, no stream shading, extensive bank damage, high water temperatures. 165 foot falls.
Harris Canyon	0.34	7568	Fair	Fair	Declining	D, St	2 foot, 7 foot, and 10 foot falls, low flow, little stream shading.
Sayrs Canyon	0.20	7568	Fair	Poor	Stable	No Fish	No pools, steep gradient, low flow, high water temperatures, little stream shading.
Buck Hollow	5.88	7579, 7510 7539, 7511 7588, 7558 unallotted	Fair	Fair	Stable	Rb, D, Csu Sq, St	Intermittent flow, poor stream shading, good water quality, fair stream cover, poor bank condition, good rainbow trout population.
Finnegan Canyon	0.35	Unallotted	Excellent	Fair	Stable	Rb, D, Sc	Intermittent flow, limited stream shading, good water quality, little spawning gravel, possible steelhead spawning area.
Cottonwood Canyon	0.20	Unallotted	Excellent	Fair	Stable	No Fish	Very little spawning gravel, intermittent flow, algae blooms, high turbidity.
Wood Gulch	0.25	Unallotted	Fair	Poor	Declining	No Fish	10 foot falls, extreme channel downgrading, low flows, pools filled with sediment.
White River	13.65	7531, 7592 Unallotted	Good	Fair	Stable	Rb, Wt	60 foot falls, high turbidity and bed load, good stream shading, dense streamside vegetation.
Rock Creek	0.20	7592	Excellent	Good	Stable	Rb	Excellent streamside vegetation, good water temperatures, limited spawning gravel.
Tygh Creek	0.20	Unallotted	Good	Good	Stable	Rb, D	Excellent water quality, organic debris common in-stream, excellent stream shading.
Threemile Creek	0.44	Unallotted	Good	Poor	Stable	Rb	Intermittent flow, good bank rock content, limited stream structure.

Stream	Public[1] Stream Miles	Allotment(s)	Present Stream Channel Condition	Present Fish Habitat Condition	Estimated Trend	Fish[2] Species Present	Comments
McCubbins Gulch	1.10	Unallotted	Good	Fair	Improving	Rb	Low pool quality, limited stream structure, good water quality, excellent stream shading, high flows.
Bakeoven Creek	0.1	7511	Good	Fair	Stable	St, Rb, Bls, SpD	Low flow, excellent spawning gravel, good stream shading, good water quality.
Deep Creek	1.70	7512, 7548	Good	Good	Stable	Rb, Su, D, Sqs, St	High water temperatures, channel spreading at high flows, algae blooms, highly possible steelhead spawning area.
Cottonwood Creek	0.92	7512	Fair	Fair	Stable	Rb, Su, D	Extensive gravel bars, low flows, fair stream shading, high benthic biomass.
Wapinitia Creek	2.0	7553, 7520	Good	Good	Improving	St, Rb, Su, D, Sq	Low flows, stream well shaded, steep gradient, good water quality.
Cove Creek	0.70	7577	Good	Good	Stable	No Fish	Low flows, stream well shaded, steep gradient, poor pool riffle ratio, banks stable.
Swamp Creek	0.30	7541	Good	Poor	Improving	No Fish	Siltation, culvert blocks upstream migration, limited pool area, limited stream shading, low flow, no spawning gravel, limited stream shading.
Jersey School Spring	0.35	7541	Good	Poor	Improving	No Fish	Siltation, low flow, dense aquatic vegetation growth, no pool area, limited stream shading.
Trout Creek	1.77	7518, 7587, 7591, 7560, 7526, 7546 unallotted	Fair	Fair	Stable	St, Rb, Sc, Cch, Wt, Sq, RsS, D, Csu	Abundant spawning gravel, good water quality, irrigation withdrawals, limited pool area, siltation.
Tributary to Sagebrush Creek	1.0	7521	Good	Poor	Declining	No Fish	Ten small beaver dams, abundant organic matter instream, poor pool riffle ratio, excess irrigation water feeds stream, high water temperatures.

Stream	Public[1] Stream Miles	Allotment(s)	Present Stream Channel Condition	Present Fish Habitat Condition	Estimated Trend	Fish[2] Species Present	Comments
Tributary to Sagebrush Creek	0.25	7521	Good	Poor	Stable	No Fish	All flow derived from excess irrigation water, high water temperatures, no pools.
Brocher Creek	2.50	7541, 7591	Good	Fair	Stable	Rb, D	Five bedrock cascades 3 foot to 10 foot high, good spawning gravel, low flows, limited stream shading, pools shallow.
Ward Creek	1.60	7560, 7525, 7550	Good	Fair	Stable	Rb, Rs Bls, SpD	6 foot logjam, little spawning gravel, algae blooms, high bank rock content.
Willow Creek (Madras)	3.5	7529 Unallotted	Good	Fair	Improving	Rb, Bls, D	Variable flow, heavy aquatic vegetation growth, steep gradient, limited spawning gravel, excess irrigation flows into stream, siltation.
Lower Crooked River	1.25	7571 Unallotted	Good	Fair	Stable	Rb, Su	Limited spawning area, bottom covered with sand and silt, good water quality, constant flows, stream well shaded, many springs feed river, banks stable, diversion dam inhibits upstream migration from lake.
Keller Creek							
Honeysuckle Creek							
Ladon Creek							
Mosier Creek	3.2	7540					
Tributary to NF Mill Creek							

Streams in The Dalles Watershed Not Inventoried

Appendix N Stream Channel Stability and Fish Habitat and Estimated Trend (Continued)

John Day River

Stream	Public[1] Stream Miles	Allotment(s)	Present Stream Channel Condition	Present Fish Habitat Condition	Estimated Trend	Fish[2] Species Present	Comments
John Day River	1.55	2648	Fair	Fair	Stable	St, Sb,	Irrigation withdrawals, wide annual flow fluctuations, high water temperatures, limited stream shading, good warm water fishery, streamside vegetation very limited.
	0.55	2617	Fair	Fair	Stable	Sq, Sc,	
	0.95	2555	Poor	Fair	Stable	Cc, Cch,	
	0.95	2594	Poor	Fair	Stable	Chs, D,	
	0.90	2562	Fair	Fair	Stable	Su, C,	
	0.10	2513	Good	Fair	Stable	Wbl	
	2.0	2595	Poor	Fair	Stable		
	1.6	2560	Poor	Fair	Stable		
	0.85	2598	Fair	Fair	Stable		
	5.0	2520	Fair	Poor	Stable		
	11.25	2597	Fair	Fair	Stable		
	0.25	2553	Fair	Fair	Stable		
	4.15	2591	Fair	Fair	Stable		
	3.25	2509	Fair	Fair	Stable		
	13.45	2572	Fair	Fair	Stable		
	6.40	2522	Good	Fair	Stable		
	5.5	2538	Fair	Fair	Stable		
	1.95	2521	Fair	Fair	Stable		
	2.10	2629	Fair	Fair	Stable		
	24.65	2619	Fair	Fair	Stable		
	2.80	2608	Fair	Fair	Stable		
	8.30	2647	Fair	Fair	Stable		
	2.0	2610	Fair	Fair	Stable		
	0.8	2518	Fair	Fair	Stable		
	7.35	2584	Fair	Fair	Stable		
	3.75	2623	Fair	Fair	Stable		
	0.55	2614	Fair	Fair	Stable		
	0.65	2588	Poor	Fair	Stable		
	5.34	2512	Poor	Fair	Stable		
	0.20	2535	Poor	Fair	Stable		
	6.40	2633	Fair	Fair	Stable		
	1.05	2545	Fair	Fair	Stable		
	1.50	2624	Good	Good	Stable		
	1.0	2533	Poor	Fair	Stable		
	0.90	2532	Fair	Fair	Stable		
	0.25	2570	Fair	Fair	Stable		
	3.0	2556	Fair	Fair	Stable		
	1.85	2569	Fair	Fair	Stable		
	0.75	2544	Fair	Fair	Stable		
	3.35	2515	Fair	Fair	Stable		
	2.75	2625	Fair	Fair	Stable		
	1.20	2563	Fair	Fair	Stable		
	0.30	2564	Fair	Fair	Stable		

[1]Allotment boundaries are, in most cases, in the center of the river. Therefore, only bank miles can be given for the John Day River.

Stream	Public[1] Stream Miles	Allotment(s)	Present Stream Channel Condition	Present Fish Habitat Condition	Estimated Trend	Fish[2] Species Present	Comments
	1.30	2626	Fair	Fair	Stable		
	0.20	2565	Fair	Fair	Stable		
	0.50	2528	Fair	Fair	Stable		
	4.0	2554	Poor	Fair	Stable		
	0.5	2575	Fair	Fair	Stable		
	0.8	Not leased	Fair	Fair	Stable		
Emigrant Canyon	0.50	2617	Fair	Poor	Declining	No Fish	Intermittent flow, no spawning gravel, no stream shading, extensive bank damage.
Grass Valley Canyon	2.1	2620, 2513, Unallotted	Fair	Poor	Declining	St, RsS, D, Sq, Csu	Intermittent flow, no stream shading, poor pool to riffle ratio, high water temperatures, cement road crossing blocks upstream migration.
Rock Creek (Condon)	0.6	2525, 2637	Good	Fair	Stable	D, RsS, Csu	Excellent pool quality, limited stream shading, limited spawning gravel, good water quality, occurrence of steelhead and rainbow trout possible.
Hay Creek	4.5	2598, 2547, 2607	Fair	Poor	Stable	No Fish	Low flow, no stream shading, adequate spawning gravel, high water temperatures, no streamside cover, few pools.
Cottonwood Canyon	1.55	2636, 2597	Fair	Poor	Declining	No Fish	Intermittent flow, high water temperatures, siltation.
Ferry Canyon	2.75	2619	Good	Poor	Stable	D, Sq	Limited stream shading, low flows, high water temperatures, siltation, poor pool to riffle ratio, occurrence of steelhead and rainbow trout possible.
Little Ferry Canyon	2.70	2509, 2591, 2631	Fair	Fair	Stable	Rb, Su, Sq	Occurrence of rainbow trout possible, low flow, limited stream structure, little stream shading, spring originates flow.

Stream	Public[1] Stream Miles	Allotment(s)	Present Stream Channel Condition	Present Fish Habitat Condition	Estimated Trend	Fish[2] Species Present	Comments
Jacknife Canyon	6.80	2572, 2541, 2581, 2566	Fair	Poor	Stable	St, Bls, D, Rb	Intermittent flow, important steelhead spawning and rearing area, limited stream shading, poor pool to riffle ratio, 0.75 miles of surface flow during the summer.
Thirtymile Creek	0.25	2608	Fair	Poor	Stable	D, RsS	No stream shading, high water temperatures, poor pool to riffle ratio, algae blooms, gas pipeline in canyon bottom, poor habitat structure, possible rainbow trout and steelhead present.
Condon Creek	0.8	2549	Poor	Poor	Stable	No Fish	Low flow, limited pool area, no stream shading, limited spawning gravel.
East Fork Thirtymile Creek	0.6	Unallotted	Fair	Poor	Stable	RsS, D	Low flow, high water temperatures, no stream shading, good water quality.
Pine Hollow	6.60	2608, 2518, 2629, 2593	Good	Fair	Stable	St, Rb, BlS, D, Sq	Steelhead spawning and rearing area, good rainbow trout population, intermittent flow, gas pipeline at bottom of canyon, limited stream shading.
Long Hollow	1.35	2518	Good	Poor	Stable	St, Rb, Bls, D	Abundant spawning gravel, limited pool area, no stream shading, high water temperatures.
Brush Canyon	0.25	2514	Fair	Poor	Improving	No Fish	Low flow, poor spawning area condition, poor stream structure, limited limited stream shading, few pools.
Sorefoot Creek	2.25	2614, 2584	Fair	Poor	Declining	No Fish	Low flow, high water temperatures, siltation, high seasonal turbidity, steep gradient, poor bank condition.
Pine Creek	0.30	Unallotted	Fair	Fair	Stable	No Fish	Heavy siltation, poor spawning and and rearing area, good stream shading, 3 foot logjam blocks migration.
Muddy Creek	0.85	2512	Fair	Poor	Declining	D, Sq	Stream bottom consolidated, poor pool to riffle ratio, no stream shading, low flow, no stream structure, possible steelhead spawning area.

Stream	Public1/ Stream Miles	Allotment(s)	Present Stream Channel Condition	Present Fish Habitat Condition	Estimated Trend	Fish 2/ Species Present	Comments
Currant Creek	0.95	2512	Fair	Poor	Stable	No Fish	Intermittent flow, low pool area, no stream shading.
Nelson Creek	0.30	Unallotted	Good	Fair	Stable	No Fish	Steep gradient, siltation, no pools, good water quality.
Girds Creek	1.75 2561	2537, 2533	Fair	Poor	Stable	No Fish	Some stream channelization, low flows, no spawning gravel, no pools, no stream structure.
Red Mud Creek	0.25	2529	Fair	Poor	Improving	No Fish	Stream bottom consolidated, no pools, excellent stream shading, steep gradient, low flow.
Horseshoe Creek	0.20	2515	Good	Fair	Stable	D	Low flow, few pools, limited stream shading, steep gradient, possible steelhead spawning area.
Lefthand Creek	0.30	2565	Fair	Poor	Stable	No Fish	Low flow, no spawning area, poor pool to riffle ratio, grazing.
Indian Hollow	0.3	2563	Good	Poor	Stable	No Fish	Low flow, siltation, excellent stream shading, few pools.
Johnson Creek	1.65	2626	Good	Fair	Stable	Rb, St	Limited spawning gravel, low flows, good pool to riffle ratio, good stream shading, logging debris common in channel.
China Hat Creek	0.25	2626	Fair	Poor	Declining	No Fish	Siltation, 20 foot falls, heavy cattle grazing, poor stream structure, heavy algae growth.
McGinnis Creek	0.75	4145 (Two county Burns)	Fair	Poor	Declining	No Fish	Heavy cattle grazing,extreme siltation, low flow, no pool, no pool area, limited stream shading, all water diverted into canal.
Harry Creek	1.0	4145 (Two County Burns)	Fair	Poor	Stable	No Fish	Low flow, siltation, moderate grazing, no pools, no stream structure
Bull Canyon	1.1	2501	Poor	Poor	Declining	No Fish	Low flow, siltation, no pools, steep gradient, no stream structure.
Squaw Creek	0.95	2558	Good	Fair	Stable	Rb, St	Excellent stream shading, good steelhead spawning area, irrigation withdrawals at mouth.
Frank Creek	0.30	2558	Good	Poor	Stable	No Fish	Low flow, siltation, moderate grazing.
Buckhorn Creek	0.70	2558	Good	Fair	Stable	Rb	Good stream shading, good stream structure, low flows, steelhead spawning highly possible.
Indian Creek	0.20	2642	Good	Fair	Stable	Rb, St	Limited stream shading, good stream structure, low flows.

Stream	Public 1/ Stream Miles	Allotment(s)	Present Stream Channel Condition	Present Fish Habitat Condition	Estimated Trend	Fish 2/ Species Present	Comments
Rock Creek (Lower Antone)	0.30	Tri-Creek 2645	Fair	Poor	Stable	St, D	Channelization immediately upstream, high water temperatures, irrigation withdrawals.
Rock Creek (Upper Antone)	0.95	2551	Good	Good	Stable	Rb, St	Excellent water quality, constant annual flows, good bank condition, excellent stream structure.
Birch Creek	0.32	Washington Investment 2660	Fair	Poor	Declining	Rb, D	Poor stream structure, high water velocity, excellent stream shading, outstanding water quality, logging planned in watershed.
Birch Creek (E.Fork)	0.10	Tri-Creek 2645	Good	Fair	Stable	No Fish	Poor habitat types, high water velocity, velocity, excellent stream shading, logging planned in watershed.
Birch Creek (W. Fork)	1.80	Tri-Creek 2645	Fair	Poor	Stable	Rb	Numerous debris jams, high water velocity, limited habitat types, excellent streamside cover, logging planned in watershed.
Tributary to West Fork Birch Creek	0.71	Tri-Creek 2645	Good	Poor	Stable	No Fish	20 percent gradient, excellent water quality, excellent streamside cover, constant low flow.
Willow Creek (Mitchell)	0.65	2559, 2639	Good	Poor	Stable	D	Low flow, good spawning and rearing area, limited stream shading
Fopiano Creek	0.50	2559, 1639	Good	Fair	Stable	D	Low flow, good bank condition, limited stream shading.
Day Creek	0.50	Mascall Uppendahl (Taylor/ Burns) Cottonwood Creek 4076, 4131	Fair	Poor	Declining	No Fish	Siltation, low flow, steep gradient, good stream shading, poor bank condition.
Trout Creek	0.5	2568, 2586	Fair	Fair	Stable	St, Rb, Sc, Cch, Wt, Sq, RsS, D Csu	Moderate spawning gravel, irrigation withdrawals, limited pool area, siltation.

Stream	Public 1/ Stream Miles	Allotment(s)	Present Stream Channel Condition	Present Fish Habitat Condition	Estimated Trend	Fish 2/ Species Present	Comments
Thompson Creek	0.4	2655	Fair	Poor	Declining	D	No pools, siltation, low flow, banks unstable.
Big Summit Tributaries Not Inventories							
Dudley Creek	0.5	2502				Rb	
Cram Creek	0.1	2508				Rb	
Howard Creek	0.25	2508				Rb	
NF Crooked River	1.15	2519, 2580				Rb	
Fox Creek	0.15	2580				Rb	
Elliot Creek Ditchline & Tributary	0.85	2519					
Columbia River Tributaries							
Willow Creek (Arlington)	0.40	Unallotted 2579	Fair	Fair	Stable	D, Cch, Sq, Csu	Extensive bank damage, no stream shading, high water temperatures, possible steelhead spawning.
Eightmile Canyon	1.50	2571	Fair	Poor	Improving	No Fish	Intermittent flow, banks unstable, high water temperatures, siltation, no spawning gravel, good pool area.

Habitat Quality

Quality	Definition
Poor	Natural stream habitat drastically altered. Very little, or no, present trout production.
Fair	Stream substantially altered from natural conditions because of past or present activities; habitat either partly recovered or still decreasing in trend; some trout production but population is far below potential for streams.
Good	Stream only slightly altered from natural conditions; very limited habitat changes or nearly complete recovery; satisfactory trout population for stream.
Excellent	Stream habitat virtually unchanged from natural conditions or is highly productive for aquatic life; trout population at potential.

Appendix O Methodology Used to Determine Vegetation Site Classification and Predict Ecological Condition

Classification

The classification system used in site identification was the Oregon Automated Ecological Site Information System (OAESIS) developed by the BLM Oregon State Office. The OAESIS guide contains range sites created by combining similar sites from Soil Conservation Service site guides for Oregon and Washington.

Vegetation composition and production were the criteria used for determining similar sites. The site is interpreted based on soil characteristics, including texture and depth and climax vegetation. Information and data concerning this system are available at the Prineville District Office.

Inventory crews identified and delineated boundaries of sites to be inspected. Soil mapping units were subdivided into areas of homogenous vegetation communities. Estimates of relative plant species composition, based on dry weight, were made for the plant community at each site. Using OAESIS, the present species composition was compared to the potential climax composition for the site. A condition rating was computed for the vegetation on each site representing the extent to which the site differs from potential climax. This condition rating is referred to as ecological condition.

Ecological condition is described as successional stages of plant communities. A plant community in climax stage is a community which exhibits little change in species composition when compared to the potential climax plant community for the site.

Between 75 and 100 percent of the kinds and amounts of vegetation produced would be found in climax. Communities in late seral stage produce between 51 and 75 percent of the kinds and amounts of vegetation found in climax. Communities in middle seral stage produce between 26 and 50 percent of the kinds and amounts of vegetation found in climax. Communities in early seral stage produce between 0 and 25 percent of the kinds and amounts of vegetation found in climax.

A fifth condition class designated as 'unclassified' was used in the inventory to designate areas without vegetation or as areas unsuitable for grazing such as rock outcrops, sand dunes, or extremely steep slopes. Seedings are also included in this category.

Problems were encountered in preparing this RMP/EIS due to limited vegetative resource data, even though the majority of the planning area has been classified on the OAESIS system. As a result, the OAESIS information was extrapolated allotment by allotment to encompass most of the public land in the planning area.

Ecological Condition

It was assumed that upland vegetation would in some degree respond to changes in management (grazing systems). Systems such as early spring, deferred, deferred rotation, rest rotation winter and exclusion would cause a change in condition toward climax. A deferred rotation system requiring only one year deferment of every three grazing (the minimum acceptable under Alternatives A, B, and D) would cause a change toward climax 50 percent of the time and would maintain existing conditions 50 percent of the time. Spring/summer grazing would create a change away from climax conditions.

It was also assumed that not all ecological condition classes would respond in the same way with good management. Climax condition vegetation was assumed to stay at climax except that 10 percent of climax vegetation was assumed to change to late seral over the long term because of the unavoidable invasion of shrubs. Late seral vegetation was not expected to change toward climax because of the presence of big sagebrush in the ecosystem. The only way to change late seral vegetation would be through sagebrush control and none was proposed for this condition class. Mid seral and the upper half of early seral vegetation was expected to change one class toward climax. The lower half of early seral would not change because of a lack of native bunchgrasses.

Riparian vegetation, under exclusion, early spring or winter use, was assumed to go to climax in the long term.

The exceptions are areas on the John Day River where fluctuating water levels, bank scouring and so forth would make establishment of riparian vegetation difficult. For these areas it was assumed that mid seral condition would be the highest level obtainable in 20 years.

With the exception of riparian vegetation, it was assumed that ecological condition classes were equally distributed through all vegetation types.

Sagebrush Control

It was assumed that the majority of sagebrush burning would occur on mid seral stage vegetation with the remaining burning to occur on early seral vegetation. The result would be a change in one condition class toward climax.

Burning and seeding would be done only in early seral vegetation and would result in a condition class of "unclassified/other".

For purposes of analysis, it was assumed ecological condition on the 31,969 unalloted acres would remain static under all alternatives.

Existing and Proposed Grazing Systems

For existing management (Alternative C), it was assumed 75 percent of the allotments with some sort of identified management plans were being managed to encourage change toward climax in ecological conditions. For the other 25 percent it was assumed conditions were static. On the rest of the leased acres in the planning area, it was assumed that 5 percent were being managed to change toward climax, 45 percent were static and 50 percent were under management moving ecological condition toward early seral condition.

Under Alternatives A and B, it was assumed that all I allotments and all M allotments greater than 1,000 acres would be managed under rest rotation, early spring, deferred, deferred rotation, or winter systems, encouraging change in condition toward climax. All M allotments less than 1,000 acres and all C allotments would receive deferment one in three years.

Appendix P Wildlife Habitat Interrelationships

Common Name	Rel. Abundance	1 Juniper Grass	2 Bunch Grass	3 Crestd Wheatgrass	4 Big Sage Grass	5 Low Sage Grass	6 Other Brush	7 Junip. Bitter brush	8 Junip Big Sage	9 Junip Low Sage	10 Riparian	11 Mtn. Mahogany	12 Pond. Pine	13 Fir Pine Mixed	14 Oak Grass
Life Form 1. Reproduces in water and feeds in water (34 species).															
Black Crappie	U										RFXP				
Bluegill	C										RFXP				
Bridgelip Sucker	C										RFXP				
Brown Bullhead	C										RFXP				
Brown Trout	R										RFXP				
Carp	U										RFXP				
Channel Catfish	R										RFXP				
Chiselmouth Chub	C										RFXP				
Chinook Salmon	U										RFXP				
Coho Salmon	U										RFXP				
Cutthroat Trout	U										RFXP				
Dolly Varden	U										RFXP				
Kamloop Trout	R										RFXP				
Large Scale Sucker	C										RFXP				
Largemouth Bass	C										RFXP				
Leopard Dace	C										RFXP				
Longnose Dace	U										RFXP				
Mountain Whitefish	C										RFXP				
Northern Squawfish	C										RFXP				
Painted Turtle	U										RFXP				
Peamouth	C										RFXP				
Piute Sculpin	U										RFXP				
Pumpkinseed	R										RFXP				
Rainbow Trout	V										RFXP				
Redside Shiner	C										RFXP				
Smallmouth Bass	C										RFXP				
Sockeye Salmon	U										RFXP				
Speckled Dace	C										RFXP				
Steelhead Trout	C										RFXP				
Tui Chub (Roach)	C										RFXP				
Umatilla Dace	R										RFXP				
Western Brook Lamprey	U										RFXP				
White Crappie	U										RFXP				
Bullfrog	U										RFXP				
Life Form 2. Reproduces in water and feeds on the ground, in bushes, and/or in treas (7 species).															
Great Basin Spadefoot	U			RFXP		RFXP		RFLP							
Northern Long Toed Salamander	R			RFLP				RFLO	RFLO			RFXO	RFXO		FLO
Northern Rough skinned Newt	U		RFLO								RFLP		RFLP	RFLO	FXP
Pacific Giant Salamander	R										RFXP				
Pacific Tree Frog	C			RFLO	RFXO		RFXO	RFLO	RFLO		RFXP	RFLO	RFXP	RFXP	FLP
Spotted Frog	C				RFXO				RFLO	RFLO	RFXP		RFLO	RFLO	FLD
Western Toad	U			RFLO	RFXO		RFXP	RFLO	RFLO		RFXP	RFLO	RFLO	RFLO	FLD
Life Form 3. Reproduces on the ground around water (or in evergent vegetation, or on floating vegetation) and feeds on the ground and in bushes, trees and water (63 species).															
California Mountain Kingsnake	R										RFLP		RFLP	RFLP	
Common Garter Snake	C	RFXO	RFXO		RFXP		RFXP				RFXP		RFXO	RFXO	RFLD
Western Skunk	U	RFLO			RFLO		RFLO	RFLO	RFLO		RFXP	RFLO	RFXP	RFLP	RFLP
American Avocet	U		RLO								RFXP				
American Bittern	R										RFXP				
American Coot	C					FXO					RFXP				
American Dipper	R										RFXP				
American Wigeon	U		FLO								RFXP				
Bairds Sandpiper	E										RFLP			RFLP	
Black Tern	U		RLP								FLP				
Black Bellied Plover	E										FLP				
Black Necked Stilt	R										RFLP				
Blue Winged Teal	U			RFLO							RFXP				
Cackling Goose	U										RFXP				
California Gull	U		RLP								RFXP				
Canada Goose	C										RFXP				

Common Name	Rel. Abundance	Juniper Grass	2 Bunch Grass	3 Crested Wheatgrass	4 Big Sage Grass	5 Low Sage Grass	6 Other Brush	7 Junip Bitter brush	8 Junip Big Sage	9 Junip Low Sage	10 Riparian	11 Mtn. Mahogany	12 Fir Pond Pine	13 Pine Mixed	14 Oak Grass
Canvasback	R										FXP				
Cinnamon Teal	R		RFLO								RFXP				
Common Loon	R										FXP				
Common Pintail	C		RFLO								RFXP				
Common Snipe	R										RFXP				
Common Yellowthroat	R										RFXP				
Double Crested Cormorant							Crested				RFXP				Cormorant
Eared Grebe	R										RFXP				
European Wigeon	E										FLP				
Forsters Tern	R		RLP								RFLP		FLO		
Franklins Gull	E		RLP								RFLP		FLO		
Gadwall	R		RFLP								RFXP				
Greater Scaup	U										RFXP				
Greater Yellowlegs	U										RFLP				
Green Winged Teal	C		RFLO								RFXP				
Green Winged Teal	C		RFLO								RFXP				
Harlequin Duck	E										FLP				
Horned Grebe	E										RFXP				
Killdeer	C										RFXP				
Least Sandpiper	R										RFLP				
Lesser Scaup	C										RFXP				
Lesser Snow Goose	R										FXP				
Lesser Yellowlegs	U										RFLP				
Long Billed Curlew	R		RFXP								FXP				
Long Billed Dowitcher	C										RFXP				
Mallard	V		RFXO								RFXP				
Marbled Godwit	E		RLP								RFLP				
Marsh Wren	R										RFXP				
Northern Shoveler	U		RFXO								RFXP				
Pied Billed Grebe	U										RFXP				
Redhead	U										RFXP				
Ring Billed Gull	U		RLP									RFLP		FLO	
Ring Necked Duck	U										RFXP				
Ruddy Duck	U										RFXP				
Sanderling	R										RFLP				
Sandhill Crane	R					FLO					RFXP				
Small Canada Goose	U										RFXP				
Snowy Plover	E										RFLP				
Spotted Sandpiper	C									RFXP					
Trumpeter Swan	E									FXP					
Western Grebe	R									RFXP					
Western Sandpiper	R									RFLP					
Whistling Swan	U									RFXP					
White Pelican	R									FXP					
White Fronted Goose	R									FXP					
Willet	U									RFXP					
Winter Wren	U									FXO		RFXP	RFXP		
Western Jumping Mouse	U	RFLO								RFLP		RFLP	RFLP		

Life Form 4. Reproduces in cliffs, caves, rimrock, and/or talus and feeds on the ground or in the air (24 species).

Side Blotched Lizard	C	RFLP	RFXP	RFLO	RFXP	RFXP	RFXO	RFLO	RFXP	RFXP	RFLO				
Barn Swallow	U	FLO		RFLP			FLO	RFLO		RFLP	FLO				
Canyon Wren	U	RFXP		RFLO	RFLP	FLO	FLO			RFXP	FLO			FLO	
Chukar	C	RFXO		RFXP	FLO	RFXP	RFLO			FXP					
Cliff Swallow	C	FLO		RFLP	FLO	FLO	FLP	FLP	FLO	RFLP	FLO			FLP	
Common Raven	V	RFXP	RFXP	FXO	RFXP	RFXP	RFXP	RFXP	RFXP	RFXP	RFXP	RFXP	RFXP	RFXP	FLP
Ferruginous Hawk	C	PFLO	RFLP	FLO	FLO		FLO	RFLO	RFLO	RFLO	RFXO	RFXO	RFLO	FXP	
Golden Eagle	C	RFXO	FXP	FLO	FXP	FLO	FLO	RFXO	RFXO	RFLO	RFXP	FLO	RFXO	RFXO	FXO
Peregrine Falcon	E	FLO	FLO		FLO	FLO	FLO	FLO	FLO	FLO	FXP	FLO	FLO	FLO	FLO
Prairie Falcon	U	RFLO	RFXP	FLO	RFXP	RFXO	RFXO	RFXO	RFXO	RFXO	FXP	FLO	RFLO	FLO	
Rock Dove	C	RFXP	FLO	RLP	RFLP					RFLP					
Rock Wren	U	FLO		RFLP	RFLP	RFLO				RFLP	FLO			FLO	
Says Phoebe	U	RFLP			FLP	FLO		FLP	RFLP	RFLP	RFLP	FLP	RFLP		FLP
Turkey Vulture	C	FXO	FXP	FLO	RFXP	FXO	FXO	RFXP	RFXP	RFXP	FXP	FLP	RFXO	RFXO	FLP
Bobcat	U	RFXP	FLP	FLO	RFXP	RFLP	RFXP	RFLP	RFLP	RFLP	RFXP	RFLP	RFXO	RFLO	RFLP
Bushy Tailed Woodrat	C	RFXP	FXO		FXP	FXO	FLO	RFXP	RFXP	RFXO	FLO			RFXO	
Canyon Mouse	U	RFLO	RFLP		RFXP			RFLO	RFLO		RFLO				
Mountain Lion	E	FLP		FXO		FLO			FLO	FXP	RFXP	RFXP	RFXP	RFLP	
Pallid Bat	R	FLO			RFLP	FLO		RFLP	RFLP	FLO	RFLP				

Common Name	Rel. Abun-dance	1 Juni-per Grass	2 Bunch Grass	3 Crestd Wheat-grass	4 Big Sage Grass	5 Low Sage Grass	6 Other Brush	7 Junip Bitter brush	8 Junip Big Sage	9 Junip Low Sage	10 Ripar-ian	11 Mtn. Mahog-any	12 Pond Pine	13 Fir Pine Mixed	14 Oak Grass
Pinon Mouse	C				RFXO		RFLO	RFLO	RFXP	RFLO		RFLO			RFLO
Small Footed Myotis	R				RFLP	FLO					RFLP				
Townsend Big Eared Bat	R	RFXP	RFLP		RFXP	RFLO	RFXP	RFXO	RFXP	RFLO	RFXP				
Western Pipistrelle	U				RFLP		RFLO		FLO		RFLP				
Yellow Bellied Marmot	C	RFLO	RFXP	RFLO	RFXP	RFLO	RFXP	RFLO	RFXP	RFLO	FXP	RFLO	RFXO		
LIfe Form 5. Reproduces on the ground without specific water, cliff, rimrock or talus association and feeds on the ground (40 species).															
Desert Nightsnake	E		RFLP	FLO	RFLP	RFLP	FLO					FLO			
Gopher Snake	C	RFXP	RFXO		RFXP	RFLO	RFXP	RFXP	RFXP	RFXO	RFXP				RFLP
Great Basin Whiptail	U										RFLP		RFLO		
Northern Pacific Rattlesnake	C	RFXP	RFXP	RFXO	RFXP	RFXO	RFXP	RFXO	RFXP	RFXO	RFXP	RFXO	RFXO	FLO	RFLP
Oregon Alligator Lizard	U		RFLO	RFLP		RFLO	RFLO					RFLP	RFLP	RFLP	RFLP
Pigmy Horned Lizard	U	RFLO	RFLO		RFLP	RFLP		RFLO	RFXP						
Sagebrush Lizard	C	RFXP	RFLO		RFXP	RFLO	RFLO	RFLP	RFLP	RFLO		RFLO			RFLO
Striped Whipsnake	R	RFLO	FLO		RFXP	RFLP	RFLO	RFLP	RFLO				RFLP		RFLP
Wandering Gartersnake	U		RFLP		RFLO		RFLP	RFLO	RFLO	RFLO	RFXP				RFLO
Western Fence Lizard	C	RFXP	RFXP	RFLO	RFXP	RFXP	RFLO	RFLO	RFLO	RFXP		RFLO	RFLO		RFLP
Western Yellow Bellied Racer	C		RFLP		RFLP	RFLP		RFLO	RFLP	RFLO	RFLP				RFLP
Bobolink	R										RFLP				
California Quail	C	RFLO			RFXP		RFXP	RFLO	RFXP	FLO	RFXP				RFLP
Gray Partridge	E		RFXP				RFXP					RFLO			
Hermit Thrush	R										FXO		RFLO	RFXP	RFLO
Horned Lark	C		RFXP	FXO		RFXP									
Lark Sparrow	C	RFLO	FLO		RFXP	RFLO			FLO	FLO	RFLP				RFLP
Marsh Hawk	C	FLO	RFXP	FLO	FXP		RFLP				RFLP				
Mountain Quail	R						RFXP				RFXP		RFXP	RFXP	FLP
Northern Junco	C				RFXP	RFLO	RFXP	RFLP	RFLP	RFLO	RFLP	FLO			FLP
Ring Necked Pheasant	U		RFXP		RRXP		RFXP				RFXP				
Ruffed Grouse	R						RFXP				RFXP		RFXO	RFXP	RFLP
Sage Grouse	U		FXP	FXO	RFXP	FLO	FLO		FLO	FLO	FLP				RFLP
Savannah Sparrow	C	FLO	RFXP		RFLO	RFXP				FLP	FLO	FLO			FLO
Short Eared Owl	R		FXP	FLO	FLP	FLO	FLO	RFLO	RFXP		RFXP				
Turkey	R		FLO				RFXP				FLP		RFXP	RFLO	RFXP
Veery	R										RFLP	FLO			
Vesper Sparrow	C	FLP	RFLP		RFLO	RFLP	FLO		FLO		FLO				RFLP
Water Pipit	R										FLO				
Western Meadowlark	C	RFXO	RFXP	FLO	RFXO	RFXP	RFLO	RFXO	RFLO	RFXO	FLP				RFXP
Wilsons Warbler	R				FLO		FLO				RFLP				
Black Tailed Deer	U								FLP			RFLP			
Black Tailed Jackrabbit	C	RFXO	RFXO	FLO	RFXP	RFXP	RFLO	RFXO	RFXO	RFLO	FLP				
Feral Horse	R		RFLP	FLO	RFXP	FLO	RFLP	RFLP	RFLP	RFLO	FXP		RFXP	RFXP	
Feral House Cat	R	RFLP	RFLP		RFXP		RFLO	RFLP	RFLP	RFLP					
Pronghorn Antelope	C	RFXO	FXO	FXP	RFXP	RFXP		FXP	RFXP	RFXP		FLO	FLO		
Rocky Mountain Elk	U				FLO	FLO	RFLO				RFXP	FLO	RFXP	RFXP	RFXP
Rocky Mountain Mule Deer	V	RFXP	RFXO	FXP	RFXP	FXP	RFXP	RFXP	RFXP	FXO	FXP	FLO	RFXP	RFXP	RFLP
Snowshoe Hare	R										FLO			RFLP	
White Tailed Jackrabbit	E	RFLO	RFXP		RFLO		FLO	FLO	FLO	FLO	FLP				
Life Form 6. Reproduces on the ground and feeds in bushes, trees, or in the air (8 species).															
Common Nighthawk	U	RFLP	FLP		RFLP	RFLP		RFLO	RFLP	RFLO	FLP	RFLO			RFLO
Common Poor Will	R	FLP	FLP		RFLP	RFLP		FLO	FLO	FLO	FLP				RFLO
Lincolns Sparrow	C				RFXP	FLOP	RFXP				RFXP				RFLO
Nashville Warbler	E										RFLP		RFLP		RFLP
Orange Crowned Warbler	R										RFLP				RFLP
Snow Bunting	E														
Townsends Solitaire	C	RFXP	FLO		RFXP			RFXO	RFXP		FXP				FLP
Porcupine	C	RFXP			RFXO		RFLO	RFXO	RFXO		RFXO	RFXO	RFXP	RFXP	
American Robin	V	FXP	FXP	FXO		RFXO		RFXP	RFXP	RFXP	RFXP		FLO	FLO	RFLO
Black Billed Magpie	C	FXP	FXO	FXO	RFXP	FXO	RFXP	RFXP	RFXP	RFXO	RFXP	RFXO	FLO	FLO	RFLP
Black Crowned Night Heron	R										RFXP				RLO
Black Throated Sparrow	E	FLO	FLO		RFLP		RFLP		RFLO		RFLO				RFLP
Brewers Blackbird	V	FLO	FLO		RFXO	FLO	FLO		FLO		RFXP		FLO		RFLP
Brewers Sparrow	U		FLO		RFXP	FLO	RFLP	RFLO	RFLP	FXO	FLO				
Broad Tailed Hummingbird	R						RFLO				RFLP				
Brown Headed Cowbird	C		FLO		RFLO		FLO		RFXO		RFXP		RFXO	RFXO	RFLP

Common Name	Rel. Abundance	1 Junip per Grass	2 Bunch Grass	3 Crested Wheatgrass	4 Big Sage Grass	5 Low Sage Grass	6 Other Brush	7 Junip Bitter brush	8 Junip Big Sage	9 Junip Low Sage	10 Riparian	11 Mtn. Mahogany	12 Pond Pine	13 Fir Pine Mixed	14 Oak Grass
Calliope Hummingbird	R		FLO						RFLP	RFLP		FLO	RFLO	RFLO	
Chipping Sparrow	U	FLO	FLO		RFLP		RFLO	RFLO	RFLP	RFLO	RFLP	RFLO	RFLO	RFLO	RFLP
Common Redpoll	R	FLO							FLP				FLP		FLP
Eastern Kingbird	U	FLP	FXP		RFXP			RFXP	RFXP	RFXO	RFLP				RFLO
Fox Sparrow	U						FLO				RFLP	FLO	RFXP	RFXP	RFLP
Gray Flycatcher	R		FLO		RFXP	FLO	RFLO	RFLP	RFXP	FLO	RFLP	FLO	FLO		
Green Tailed Towhee	R				RFLP			RFLP	RFXP		FLO		FLO		RFLP
Lazuli Bunting	R						RFLO		FLO		RFLP				RFLP
Lesser Goldfinch	R						RFXO				RFXP				RFLP
Loggerhead Shrike	C	FLO	FLO	FLO	RFLP	RFLO		RFLO	RFLP	RFLO	FLO	FLO	FLO		RFLP
Macgillivrays Warbler	U						RFLO				RFXP				RFLP
Northern Shrike	C	FLO	FXP	FXO	FXP	FLO	FLP	FLO	FLP	FXO	FLO	FLO	FLO	FLO	FLP
Red Winged Blackbird	V										RFXP				FLP
Rufous Sided Towhee	R				RFLP		RFLO		RFLO		RFXP			RFLO	RFLO
Sage Sparrow	U			RFXP	RFXO	RFLO	RFLO	RFLP	RFXO						
Sage Thrasher	U		FLO	FLO	RFXP	FLP	RFLO	RFLP	RFLP	FXO	RFLP	FLO			
Song Sparrow	C	FLO			RFXP	RFLP		RFXP	RFXP		RFLP			FLO	RFLO
Swainsons Hawk	C	RFXP	FXP		FLO	FLP	FLO	RFLO	RFXP		RFXP		RFLO	RFLO	
Swainsons Thrush	R				FLO		FLO				RRXP		RFLP	RFLP	
Tree Sparrow	E		FLO		RFLP		RFLP				RFLO				
White Crowned Sparrow	C	FLO			RFXP		RFXP		FXP	FXO	RFLO				FLP
Yellow Headed Blackbird	C										RFXP				

Life Form 8. Reproduces in bushes and feeds in trees, bushes, or the air (5 species).

American			FLO				RFLO	FLO	FLO		RFXP		RFXO	Gold	RFLO
Bushtit	R						FLO	RFLO	RFLP		RFLP		FLO		RFLP
Dusky Fly Catcher	U		FLO				RFLO	RFLP	RFLP	RFLO	FLO		FLO	FLO	RFLP
Yellow Warbler	C				FLO			FLP	FLP		RFXP				
Yellow Breasted Chat	R				FLP		RFLO				RFLP				FLO

Life Form 9. Reproduces primarily in desiduous trees and feeds in trees, bushes, or the air (5 species).

American Redstart	E										RFXP				
Bohemian Waxwing	R							FLO	FXP	FLO	FLP		FLP	FLO	
Cedar Waxwing	U						RFLP	FLO	FXP	FLO	RFLP				FLP
House Finch	C						RFLP		FLP		RFLP	FLO		FLO	RFLP
Northern Oriole	R							RFLO	FLO			RFXP	FLO	FLO	RFLP

Life Form 10. Reproduces primarily in conifers and feeds in trees, bushes, or the air (12 species).

Black Throated Gray Warbler	R	RFLO					RFLP		RFLP					RFLP	RFLP
Clarks Nutcracker	E				FXO								RFXP	RFXP	
Golden Crowned Kinglet	R												FLP	RFLP	FLO
Olive Sided Flycatcher	R										FLP		RFLP	RFLP	FLP
Pinyon Jay	U				FXP			RFXP	RFXP	RFLO	FXP		FLO		
Red Crossbill	R												FLP	RFXP	
Ruby Crowned Kinglet	R												FLP	RFXP	FLP
Townsends Warbler	U										RFLO		FLP	RFLP	FLP
Western Flycatcher	R										RFXP	RFLP	RFLP	RFLP	
Western Tanager	U							FLO	FLO		RFXP		RFXP	RFXP	FLO
Yellow Rumpled Warbler	U										RFXP		FLO	RFXP	RFLP
Douglas Squirrel	C										FLO		RFXP	RFXP	

Life form 11. Reproduces in conifers or deciduous trees and feeds in trees, in bushes, on the ground, or in the air (13 species).

Black Headed Grosbeak	U										RFLP		RFLP	RFLP	RFLP
Cassins Finch	R							RFLO	RFLO		RFLP		RFLP	RFLP	FLO
Common Crown	U		FLO				FLO	RFLO	RFXO	FLO	RFXP		RFXP	RFXP	RFLP
Coopers Hawk	R							FLO	FLO	FLO	RFXP	FLO	RFXP	RFXP	RFLP
Evening Grosbeak	C							FLO	FXO	FLO	RFXP		RFXP	RFLP	FLP
Goshawk	R							FLO	FLO	FLO	FXP		RFXP	RFXP	FLO
Gray Jay	U								FLO		FLO		RFXP	RFXP	
Hammonds Flycatcher	U	FLO	FLO						FLO	FLO	FLP		RFXP	RFLP	
Long Eared Owl	R	RFXP	RFXP					RFLO	RFXP		RFXP		FLO	RFLO	
Merlin	E		FXP						FLO		FLP	FLO	FLP	RFLP	FLP
Mourning Dove	V	RFXP	FXP	FLO			FLO	RFXP	RFXP	RFLO	RXP		RFLO		RLP
Pine Grosbeak	E										RFLP		RFXP	RFXP	
Pine Siskin	R		FLO								FLP		RFLP	RFLP	RFLO
Purple Finch	U							RFLO	RFXO		RFLP		RFLP	RFLP	RFLO
Red Eyed Vireo	E						FLO				RFLP		FLO		
Rufous Hummingbird	U		FLO								FLP	RFXP	RFLP	FLO	
Sharp Skinned Hawk	R							FLO	FLO	FLO	FXP	FLO	RFXP	RFXP	RFLO

Common Name	Rel. Abun-dance	1 Juni-per Grass	2 Bunch Grass	3 Crestd Wheat-grass	4 Big Sage Grass	5 Low Sage Grass	6 Other Brush	7 Junip Bitter brush	8 Junip Big Sage	9 Junip Low Sage	10 Ripar-ian	11 Mtn. Mahog-any	12 Pond Pine	13 Fir Pine Mixed	14 Oak Grass
Solitary Vireo	U										FLP		FLP	RFLP	RFLP
Stellers Jay	C							FLO	FXO	FXO	RFLO		RFXP	RFXP	FLP
Varied Thrush	U										FLP		RFXP		FLP
Warbling Vireo	U						FLO				RFLP		FLO		RFLP
Western Kingbird	U				RFXP	FLO	RFLO	RFLO	RFXP	RFXO	RFXP				RFLP
Western Wood Peewee	U		FLO						FLO	FLO	RFXP		RFLP	RFLP	RFLP
Willow Flycatcher	U	FLO	FLO						FLO	FLO	FLP		RFLP	RFLP	
Hoary Bat	E							RFLO	RFLO	RFLO	RFLP		RFLP	RFLP	

Life Form 12. Reproduces on very thick branches, feeds on the ground or in water (10 species).

Bald	FXO	FXP							FXP		FXP		FLO	FLO	Eagle
Common Egret	E										FLP				
Golden Eagle	C	RFXO	FXP	FLO	FXP	FLO	FLO	RFXO	RFXO	RFLO	RFXP	FLO	RFXO	RFXO	FXO
Great Blue Heron	U										RFXP				
Great Horned Owl	C	RFXO	FLP	FLO	FLP	FLO	FLO	RFLO	RFXO	FLO	RFXP	FXO	RFXP	RFXP	RFLA
Green Heron	E										FLP				
Osprey	R										RFXP		RXP	RLO	RLA
Red Tailed Hawk	C	RFXP	FXP	FXO	FXP	FXO	FLO	RFXP	RFXP	RFXO	RFXP	FLO	RFXO	RFXO	RFLP
Roughlegged Hawk	C	FLO	FLP		FLO						FLP		FLO	FLO	
Snowy Egret	E										FLP				

Life Form 13. Reproduces in own hole excavated in tree and feeds in trees, in bushes, on the ground, or in the air (13 species).

Blackbacked Threetoed Woodpecker	R												FLP	RFXP	RFLP
Common Flicker	C	RFXP	FXO		FXO	FXO	FXO	RFXP	RFXP	RFXP	RFXP	FLO	RFXP	RFXO	RFLP
Downy Woodpecker	U								RFLO		RFXP		FLO		FLO
Hairy Woodpecker	R										RFXO		RFXP	RFLP	FLO
Lewis Woodpecker	U	RFLO						RFLO	RFXO		RFXP		RFXP	RFXP	RFLP
Northern Threetoed Woodpecker R													FLO	RFXP	FLO
Pileated Woodpecker	E												RFXP	RFXP	RFLO
Pygmy Nuthatch	R												RFXP	RFXP	
Red Breasted Nuthatch	R												FXP	RFXP	RFLO
Red Napped Sapsucker	C										RFXP		RFXP	RFXP	RFLP
White Breasted Nuthatch	R												RFXP	RFXP	RFLP
White Headed Woodpecker	R												RFXP	RFXP	
Williamsons Sapsucker	R												RFXO	RFLP	RFLP

Life Form 14. Reproduces in a hole made by another species or in a natural hole and feeds on the ground, in water, or the air (36 species).

American Kestrel	V	RFXP	FXP	FXO	FXP	FXO	FXP	RFXP	RFXP	RFXO	RFXP	FLO	RFXO	RLO	RFLP
Ash Throated Flycatcher	U		FLO					RFLP	RFXP		RFLP		RFLO		RFLP
Barn Owl	U	RFLO	FLO	FLO			FLO	RFLO	RFLP	RFLO	RFXP		RFLO	RFLO	RFLO
Barrows Goldeneye	R										RFLO				
Black Capped Chickadee	R				FLO		FLO		RFLO		RFXP		RFXO		RFLO
Brown Creeper	U										RFLO		RFXP	RFXP	FLO
Bufflehead	U												RLO		
Common Goldeneye	U										RFXP	RLO			
Common Merganser	C										RFXP				
Flammulated Owl	E												RFXP	RFXP	RFLP
Hooded Merganser	R										RFXP		RLO	RLO	
House Sparrow	C	RFXP	FLO		RFLP			RFXP	RFXP	RFXO	RFXP				RFLO
House Wren	C						FXP				RFXP		RFXP	RFLP	RFLP
Mountain Bluebird	C	RFXP	FXP	FXO	FXP	FLO	FLO	RFXP	RFXP	RFXO	RFXP	FXO	RFXO	RLO	FLP
Mountain Chickadee	R						FLO		FXO	FLO	RFXP		RFXP	RFXP	RFLO
Pigmy Owl	R	RFLP					FLO		RFLP	RFLO	RFLP		RFLP	RFLP	
Red Breasted Merganser	R										RFXP				
Saw Whet Owl	R										RFLP		RFXP	RFLP	
Screech Owl	R	RFXP	FLP			FLP	FLP	RFLO	RFXP	RFLP	RFLP		FLO		RLP
Starling	V	RFXP	FXO					RFXP	RFXP	RFLO	RFXP				
Tree Swallow	C	RFLO						RFXO	RFXP	FLO	RFXP		RFXO	RFXO	RFLO
Vauxs Swift	U										RFLP		RFLP	RFLP	FLO
Violet Green Swallow	C										RFXP		RFXO		FLO
Western Bluebird	U	RFLP	FLP	FLO	FXP	FLO	FLO	RFLP	RFXP	RFLO	RFXP	FLO	RFLO	RLO	RFLP
Woodduck	R										RFXP		RLO	RFLO	RFLP
Big Brown Bat	R	RFLO						RFLO	RFLO	RFLO	FLP		RFLP	RFLP	
California Myotis	R	FLO							FLO	FLO	FLP		RFLP	RFLP	
Fringed Myotis	R	RFLO						RFLO	RFLO	RFLO	FLP	RFLP		RFLP	RFLP

Common Name	Rel. Abun-dance	1 Juni-per Grass	2 Bunch Grass	3 Crested Wheat-grass	4 Big Sage Grass	5 Low Sage Grass	6 Other Brush	7 Junip Bitter brush	8 Junip Big Sage	9 Junip Low Sage	10 Ripar-ian	11 Mtn. Mahog-any	12 Pond Pine	13 Fir Pine Mixed	14 Oak Grass
Little Brown Myotis	R	RFXP							RFLP	RFLO	FLP	FLO	RFLP	RFLP	
Long Eared Myotis	R	FLP						FLP	FLP	FLO	FLP	R	FLP	RFLP	
Long Legged Myotis	R	FLP						FLP	FLP	FLO	FLP	R	FLP	RFLP	RFLP
Marten	E													RFXP	
Northern Flying Squirrel	R												RFXP	RFXP	
Raccoon	U										RFXP			RFXP	RFLP
Silver Haired Bat	R	FLO						FLO	FLO	FLO	FLP		RFLP	RFLP	RFLP
Yuma Myotis	R	FLP			FLP				FLP	FLO	RFLP	FLO			RFLP
Life Form 15. Reproduces in a burrow underground and feeds on the ground or under it (35 species).															
Rubber Boa					RFLO						RFLP		FLO	RFLP	RFLO
Burrowing Owl	U	RFLO	RFXP	RFXO	FLO	RFXO	FLO	FLO	FLO	RFLO					
Badger	C	RFXP	RFXP	RFXO	FXO	FXO	RFXP	RFXP	RFXP	RFXO	FXP		RFXO	RFXO	RFLP
Belding Ground Squirrel	V	RFXO	RFXO	RFXO	RFXO				RFXO		RFXP				
Black Bear	R						FLO				FLP		RFLP	RFXP	RFLP
California Ground Squirrel	V		RFXO		RFXP		RFLO		RFXP		RFXO		RFLO	RFXP	
Coast Mole	E		RFLP								RFXP		RFLP	RFLP	
Coyote	V	FXO	FXP	FXO	RFXP	RFXO	RFXP	RFXP	RFXP	RFXO	RFXP	RFXO	RFXP	RFXP	RFLP
Dark Kangaroo Mouse	E				RFLP				RFLP						
Deer Mouse	V	RFXP	RFXP	RFXO	RFXP	RFXO	RFXP	RFXP	RFXP	RFXP	RFXP	RFXO	RFXP	RFXO	RFLP
Golden Mantled Ground Squirrel	C		RFXP		FXO	FLO		RFXP	RFXP	RFXP	RFLO	RFXO	RFXP	RFXP	
Great Basin Pocket Mouse	C	RFXP			RFXP	RFXO		RFXP	RFXP	RFXO					
Heather Vole	E														
House Mouse	C						RFLP				RFLP				
Least Chipmunk	U	RFLO			RFXP	RFLO		RFLO	RFLP	RFLO					RFLP
Long Tailed Vole	E	RFLO	RFLO								RFLP		RFLO	RFLO	
Longtail Weasel	U	RFLP	RFLO	FLO	RFLP	FLO	RFLP	RFLP	RFLP	RFLO	RFLP		RFLO	RFLO	
Merriam Shrew	E				RFLP		RFLO								
Montane Vole	C		RFXP		RFXO			RFLO	RFLO		RFXP				
Mountain Cottontail	C	RFXP	FXP	FLO	RFXP	RFXO	RFXP	RFXP	RFXP	RFXO	RFXP	FLO			
Northern Grasshopper Mouse	U				RFLP				RFLP	RFLP					
Northern Pocket Gopher	V	RFXP	RFXP	RFXO	RFXP	RFXO	RFXO	RFXP	RFXP	RFXO	RFXP	RFXO	RFXP	RFXP	RFLO
Ord Kangaroo Rat	C	RFXO		RFXO	RFXP			RFXO	RFXP						
Pinon Mouse	C				RFXO		RFLO	RFLO	RFXP	RFLO		RFLO			
Pygmy Rabbit	E				RFLP										
Sagebrush Vole	U		RFLP		RFLP			RFLO	RFLP	RFLO					
Shorttail Weasel	U										RFLP		RFXP	RFXP	
Southern Red Backed Mouse	R												RFLO	RFLP	
Spotted Skunk	R						RFLP				RFLP		RFLO	RFLO	
Striped Skunk	U						RFLP				RFLP				RFLP
Townsend Ground Squirrel	C	RFXP	RFXP	RFXO	RFXP			RFXO	RFXP	RFXP	RFXO	RFXO			
Vagrant Shrew	U										RFLP				
Washington Ground Squirrel	U		RFLP		RFXP		RFLO		RFXP		RFXP		RFLO		RFXP
Western Harvest Mouse	U		RFXP		RFXP		RFLP	RFLO	RFXP		RFXP				RFLP
Yellow Pine Chipmunk	C	RFXP			RFXP	FLO		RFXP	RFXP	RFXO	RFXP	RFLO	RFXP	RFXP	
Life Form 16. Reproduces in a burrow underground and feeds in the air or in water (9 species).															
Bank Swallow	C										RFXP				
Belted Kingfisher	U										RFXP				FLO
Rough Winged Swallow	C										RFXP				FLO
Beaver	C	FXO			FXO			FXO	FXO		RFXP				
Mink	C										RFXP				
Muskrat	C										RFXP				
River Otter	R										RFXP				
Water Shrew	E						FLO				RFLP				
Water Vole	E										RFLP				

Relative Abundance

V Common in this area
C Common in this area
U Uncommon in this area
R Rare in this area
E Extremely rare in this area

Species Orientation

R Species reproduces in this type of habitat
F Species feeds in this type of habitat
L Species orientation determined from literature
X Species orientation determined from observation
P Species prefers this type of habitat
O Species occasionally uses this type of habitat

Appendix Q Areas Containing High Recreational Values

Area Name	Location	Special Values	Availability of Public Access
Johnson Heights	Approximately 1-15 miles southwest of Kimberly.	Large tracts of public land containing excellent deer, elk and cellent deer, elk and chukar hunting. Most of area also contains high scenic values.	Yes, on Squaw Creek only. Access is limited.
Sutton Mountain	Approximately 1-7 miles southwest of Twickham.	Large tract of public land containing excellent deer and chukar hunting. Area also has T&E plant species, is adjacent to a national monument and has high scenic values.	Yes, due to Girds Creek. Road only.
Stock Driveway	Just north of Willowdale on Highway 197.	Large tract of public land her excellent opportunities exist for deer hunting and trout fishing in Ward Creek.	Yes, due to Highway 197 and a public road to most of area.
Hay Creek	Approximately 13 miles northeast of Condon.	Excellent chukar hunting due to 6 to 8 springs and good habitat. Good deer hunting also for same reasons.	No legal access.
Willow Creek	Just west of Madres.	Important recreation area adjacent to Also contains significant historical values (old Rail-road Grade). Deer, chukar and quail hunting also exist in this area.	Yes, on public road west of Madras.
Birch and Dog Creeks	Approximately 1 to 7 miles southwest of the junction of Highways 19 and 26, which is approximately 16 miles south of Kimberly.	Small areas, but good deer and grouse hunting are available. Elk hunting also available. most portions.	Access limited to a 440 acre area south on Highway 26. Legal access possible to some areas from U.S. Forest Service lands by foot. No legal access to
Rock Creek	Approximately 12 miles east of Condon, off a side road adjoining Highway 206.	Small area, but fair to good deer and chukar hunting. bottom.	Foot access off county road to hillsides, but not to other lands due to private lands in creek
Thirtymile Canyon	Approximately 7 to 10 miles southwest of Condon.	Small area but fair to good chukar and deer hunting.	No legal access.

Area Name	Location	Special Values	Availability of Public Access
Service Creek	Approximately 1 to 5 miles north of Service Creek.	Small area but fair to good chukar and deer hunting.	Possibly off Highway 19, but only in one location.

Appendix R - Public Land Areas Containing Collectible Mineral, Plant, or Invertebrate Fossils

Area Name	General Location	Types of Mineral/ Fossil and Desirability to to Collect	Estimated Quantity[1]	Frequency of Occurrence	Size of Area/Legal Public Access	Quality[1]
Birch/Rock Creeks	Approximately one to four miles north of Spanish Peak.	Gold/Silver/very high	Trace–low	Very rare–rare	1,000 acres/Yes, by hiking to a 440 acre tract north of Spanish Peak	High
Stevenson Mountain	Approximately 15 to 16 miles west of Mitchell	Fire Opal, Agate, and Dendritic Nodules/very high	Low	Rare–uncommon	640 acres/Only to southern half by hiking from U.S. Forest Service lands.	High
Biggs/Moody	One mile east of Biggs and two miles east of Deschutes State Park.	Wascolite/high–very high	Low–moderate	Rare – uncommon	280 acres/Yes but bisected by interstate Federal highways. Access may be difficult	High
Gordon Ridge	Four to six miles northwest of Moro	Petrified wood/high–very high	Low	Rare	1,000 acres/Yes, hiking.	High
Wapinitia Creek	Two to three miles southwest of Maupin	Petrified wood and agate/very high	Low	Rare	20 to 100 acres/ Yes, floating the Deschutes River.	Moderate
Clarno	Clarno vicinity.	Petrified wood and plant fossils/very high	Low common,	Rare–No, but landowners depending on location	640 to 1,000 acres/ have allowed it in past years.	High
Upper Trout Creek	Four miles north of Ashwood	Gold/Silver	Trace–low	Very rare–rare	160 acres/ No.	Moderate
Hay and Willow Creeks	Nine to 11 miles east of Madras	Agate/thundereggs/high to very high	Low–moderate	Rare–common	200 acres/Yes, on 40 acres, no on 160 acres	Moderate
South Junction	One to two miles north and east of South Junction	Thundereggs/moderate–very high	Low–moderate	Rare–common	10 to 640 acres/ Public access to areas, but exact location not known.	High
Sutton Mountain	One to eight miles southwest of Twickenham	Thundereggs/moderate to very high	Low–moderate	Rare–common	10 to 640 acres/ Yes, to some scattered tracts of public land.	High
Muddy and Current Creeks	Four to 10 miles southwest of Clarno	Plant fossils/moderate to very high	Low–moderate	Rare–common	Up to 2,000 acres/ Yes, but only in locations where county road crosses public land.	High

[1]The quality of an area was determined by evaluating the type(s) of mineral/plant/invertebrate fossils available in an area, its desirability to collect, estimated quantity, frequency of occurrence, size of the area, and the availability of legal public access.

Area Name	General Location	Types of Mineral/ Fossil and Desirability to to Collect	Estimated Quantity	Frequency of Occurrence	Size of Area/Legal Public Access/	Quality
Cherry Creek	Twelve to 17 miles southwest of Clarno	Plant fossils/low--very high Perlite/low--very high	Low--moderate	Rare--common	640 to 800 acres. Access livestock driveway.	High
Dant	Ten miles southwest of Maupin	Perlite, agate & chalcedony/low--very high	Low--moderate	Rare--common	Approximately 2,900 acres/ Yes, by river floating.	High
Wilson Creek	Eight miles west of Ashwood, next to the Priday Agate Beds	Agate and thundereggs/ high--very high	Low	Rare--common	120 acres/ Yes, due to cooperative landowners	High
Junction of the John Day River and Rowe Creek Area	Two to five miles northwest of Twikenham	Plant Fossils/low--very high	Low--moderate	Rare--common	800 acres/ No.	Moderate
Antelope	Up to 10 mile radius around Antelope.	Agate/moderate--very high	Moderate	Rare -- common	280 acres/No, scattered 40 acreparcels.	Moderate
Tygh Ridge	Nine to 19 miles northeast of Maupin	Plant Fossils/low--very high	Low--moderate	Rare--common	1,000 acres/Only to a 40-acre parcel south of the Tygh Ridge cemetery and public lands in the Klcen area.	Moderate
Ashwood	Two miles north of Ashwood	Agate and thundereggs/ moderate to very high	Low--moderate	Rare--common	80 acres/No.	Moderate
White Butte	Three to four miles southwest of Mitchell	Marine Fossils/ moderate--very high	Low--moderate	Rare--common	80 acres/No.	Moderate

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